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Grassroots Heritage: A Multi-Method Investigation of How Social Media Sustain the Living Heritage of Historic Crises

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GRASSROOTS HERITAGE:
A MULTI-METHOD INVESTIGATION OF HOW SOCIAL MEDIA SUSTAIN THE LIVING HERITAGE OF HISTORIC CRISES

by

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The final copy of this thesis has been examined by the signatories, and we Find that both the content and the form meet acceptable presentation standards Of scholarly work in the above mentioned discipline.

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ABSTRACT OF THE DISSERTATION

By Sophia B Liu
(Ph.D. Technology, Media and Society; ATLAS Institute)

Grassroots Heritage: A Multi-Method Investigation of How Social Media Sustain the Living Heritage of Historic Crises

Dissertation Directed by Associate Professor Leysia Palen

Unprecedented uses of information and communication technology (ICT) and particularly social media (e.g., Wikipedia, Facebook, and Twitter) are occurring in times of crisis. This dissertation investigates the socio-technical practices emerging from the use of social media and how these practices help to *sustain the living heritage* of historic crises. The purpose is to provide empirical evidence on how heritage is a living and participatory phenomenon that needs to be considered when designing technology for heritage matters. The concepts of *grassroots heritage* and *socially-distributed curation* are offered as a way of interpreting heritage in the context of the participatory culture.

This dissertation presents a multi-method investigation to determine what crisis narratives appeared in social media and how social media were used to sustain these narratives through curatorial activities. The first study surveys the social media presence of 111 crisis events that occurred between 1960 and 2010 to examine if and how past historically significant crisis events were being commemorated in the present day through new media. Then, ethnographic and automated collection methods were used to identify narratives appearing in the social media landscape for four crisis events that exhibited a high social media presence in the survey. The dissertation presents five meta-narratives for two crisis cases: (1) the 1984 Bhopal gas leak and (2) the 2001 September 11 attacks. One critical finding is that people sustain the heritage of

historic crises in the digital world by perpetually revising narratives while adapting these messages to the new media of today. The second study critiques both the concept of "curator" as a profession as well as the concept of "curation" that is emerging from the social web to develop an initial conceptual model of curation. The final study involved the application and assessment of this initial conceptual model by analyzing the curatorial activities that produced the crisis narratives found in the first study. From this assessment, I articulate a theoretical model called *socially-distributed curation* to inform the design of future social technology.

DEDICATION

To my family, my ancestors, and all my relations.

"*Centuries brought us here so we can mend*"
– LYNX, To Mend

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to enrich the intellectual work we have created together. It is the diversity that we each bring to our lab everyday that has deepened my connection to the intellectual community we have nurtured here.

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And I express my deepest gratitude to my ancestors watching over me. I hope the wisdom behind this work reaches beyond my generation, pleases our elders, and teaches our children's children to be mindful in every deliberation they make.

"*Not one person said they regretted not making more money or working harder. They all seem to say their regrets were not spending more time with the people they love and not traveling more and not relating more to the world and the planet.*"
- Tom Robbins, From *1 Giant Leap*

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CHAPTER 1
INTRODUCTION

"History is the witness that testifies to the passing of time; it illuminates reality, vitalizes memory, provides guidance in daily life, and brings us tidings of antiquity."
– Cicero (106 BC – 43 BC)

A new cultural movement is emerging that is harnessing the power of social media to facilitate grassroots efforts in times of crisis. A new kind of heritage is being born as members of the public increasingly share stories online about past crises to strengthen disaster resilience to future crises. This civic ritual of sharing stories and engaging in social solidarity around crises has cultural value. By preserving and synthesizing narratives from the public into crisis-related best practices and lessons that need to be learned, people can more easily recognize their vulnerabilities and engage in social action for the benefit of present and future generations—this is what I call *grassroots heritage*.

1.1 Purpose of the Study

Our social inheritance comes from the history created not only by our ancestors but also by the cultural institutions that preserve it. However, through the advancements of information and communication technology (ICT) and the rising use of social media as one class of ICT, we are on the edge of fundamental changes in terms of what kinds of memories are being produced and preserved, how they are interpreted, and how they are shared to the wider public. The World Wide Web (which I refer to as "the web" in this dissertation) is a quintessential example of this change toward collective memory produced and shared by many. Our cultural record is increasingly being digitized in a more open and collaborative way, which is beginning to change our sense of heritage in the age of participatory culture. Therefore, the purpose of this

dissertation is to expand the meaning of heritage emerging from social media use in the crisis domain, which is largely uncharted territory.

A classic definition of "heritage" includes what we inherit that has been given to us from our ancestors and previous generations. Often it is the tapestry of traditions, artifacts, and values that we do not intentionally ask for but that have been ingrained into our daily lives. According to Silberman (2008), "heritage is, by its nature, a social activity embedded in a changing contemporary context," and "the challenge for digital heritage is to facilitate that activity, rather than establish a definitive simulacrum of the Past" (p. 81). In this dissertation, I broadly define heritage as a sociocultural process of making meaning out of historic phenomena. I specifically argue that heritage is a bottom-up, organizing activity with the intention of sustaining the stories and values that are meaningful and worth remembering and passing on to others.

Social media services, in particular, have become the change agents. These services are allowing multiple people to share their stories in unprecedented ways and at an unprecedented scale. They are also reminding people the value of participatory culture. Some might argue that social media has given people the opportunity to not only make history but also revise history. Therefore, social media is becoming a historic phenomenon in itself in addition to becoming a new vehicle for facilitating the preservation of historic phenomena in new ways.

Major crises[1] and disasters—natural, technological, or human-induced—are shared phenomena that have a societal impact and thus tend to be viewed as historic phenomena worth remembering. Although crises typically conjure up thoughts of danger and difficulty, crises also provide opportunities to learn how people cope with, recover from, and adapt to adversity and unexpected situations that can strengthen disaster resilience. Past crises are often resurrected to

[1] The term "crisis" is predominantly used in this dissertation to describe large-scale emergency activity that include disasters as

prevent future crises by sharing the lessons that need to be learned. In the web age, members of the public increasingly document, make sense of, and share memories and stories about crises through social media. Traditional methods for preserving and sharing this type of heritage need to be reevaluated, as they do not take into account the different technologies of memory that we are using in today's society. This dissertation focuses on the heritage of historic crises to better understand how we might preserve, share, and engage in social action to build better disaster resilient communities.

The present generation is going through major cultural transformations influenced by social, political, economic, and technological changes (e.g., increasing amount of natural hazards, changes in political governance, worldwide financial crises, and increasing access and use of ICTs like the Internet and mobile phones) that are taking place on a global scale. Therefore, I argue that "heritage" and "inheritance" means something quite different in the present day. Our heritage and what we inherit today is no longer limited to a particular place; the living heritage of today goes beyond borders and is now expanding to virtual places. Traditional methods of preserving and interpreting heritage need to be reconsidered in these changing times to foster a more contemporary understanding of heritage in the digital age.

With the ever growing amount of digital information around crises being generated, it is important to consider the long-term preservation issues of this type of information and the value of this information over time, possibly five years from now or even fifty years from now. What I argue in this dissertation is the need to think with a long view rather than just a fast view. Taking a long view—a multi-lifespan perspective—can help to uncover the patterns of vulnerability that led to historic crises that have occurred in the past. It is still unclear what role ICTs like social media can play or has already played outside of the emergency phase. With the rise in ICT-

enabled citizens using social media to engage in crisis information management activities, what happens to the digital information activities after the emergency period? Does the information providing and seeking activities subside after the response phase is over? Are there different information activities that emerge outside of the emergency phase? Are social media being used to support these activities in innovative ways? These are some of the questions that motivate this research.

1.2 Scope of the Dissertation

This dissertation brings together the idea of heritage and the domain of crises with the new phenomenon of social media and investigates what lies at the convergence of these three topics. Historic crises are ripe with heritage concerns, as they are phenomena that engender collective memory and commemoration activities around issues that have a shared value and meaning to the wider public in the present day. Social media have increasingly become the new vehicle for sharing crisis stories that are perceived to be valuable and meaningful. The idea of heritage is now taking on new meanings in the context of social media and raising questions about the participatory nature of this new medium. At the convergence of heritage, crises, and social media is the element of curation. The historical foundation of curation comes from the heritage domain. Curators tend to preserve the memories that emerge from historic crises, as they are phenomena worthy of being remembered. Social media are now being used as curatorial tools to make meaning out of historic phenomena like disasters. In the rest of this section, I explain the extent of which I focus on heritage, crises, and social media as well as how curation emerged as a phenomenon worthy of further investigation for this dissertation.

The long history of socio-cultural memory in cultural studies and digital memory research in the human-computer interaction (HCI) field provides a constructive foundation for

extending memory practices to issues of heritage in the digital context. At the same time, networked technologies, like the web and social media services, are affecting memory practices beyond what was initially anticipated in digital memory research. The time is ripe to begin looking at memory and heritage together in new ways, since people's memories are increasingly being digitized and becoming more easily searchable and sharable. When digital memory technology emerged, the focus was on how to design and use them in everyday life. Now we are beginning to understand the long-term opportunities and consequences of generating digital memories with respect to cultural heritage issues. What I argue is that heritage is a grassroots process of sharing memories in the form of narratives that are intended to sustain a culture; I refer to this as *grassroots heritage*.

Major crises and disasters are oftentimes the type of phenomenon where we know in the moment that they will make a societal impact for generations to come. People are able to more immediately and perhaps more deeply think about what memories are worth sharing and what heritage artifacts, sites, values, and practices are worth preserving in the aftermath of a crisis. They also encourage us to think about heritage issues not just retrospectively (by reflecting on the causes that led to the disaster) or even prospectively (by considering what crisis memories are worth preserving and passing on to future generations), but also while crises are happening (by documenting the disaster in real-time to gain situational awareness). Unlike other more routine phenomena, crises have the natural propensity of becoming culturally significant events worthy of documenting and remembering for posterity's sake. Although the heritage pertaining to disasters is in part about explaining how these crises have had a historical impact on society, this dissertation focuses on how crisis remembrance meets social action to strengthen society's resilience to future crises, which closely connects with the idea of hazard mitigation (Godschalk

et al., 1999). This stance links to a commonly held belief that it is not enough to just passively remember these crises by preserving this historical knowledge in institutional archives. Instead, collective remembering needs social action to more effectively communicate the lessons of past crises to ultimately strengthen community resilience to future crises. Collective remembering is beginning to take place in unprecedented ways through social media.

Social media is an umbrella term for web services (e.g., blogs, wikis, social networking sites, and media sharing sites) that facilitate ICT-based communication, content sharing, networking and collaboration. Innovative uses of social media during recent disasters have drawn widespread societal attention. Not only is the crisis itself a historic phenomenon but social media used during it are also becoming a significant phenomenon in them selves. The top timeline in Figure 1 indicates some of the crises that exhibited notable uses of social media, going as far back as the 2001 "coup de text" in the Philippines. The bottom timeline in Figure 1 depicts the evolution of networked technology, showing when the Internet, the web, cellphones, and particular social media services were launched. This timeline is demarcated into three technological ages: pre-web age, web age, and social media age. I define the *pre-web age* as the period before the web became available in 1993. I define the *web age* as the period between 1993 and before the introduction of social media services. I define the *social media age*[2] as the current age that started when the Blogger and Live Journal blogging services were first launched.

[2] In this dissertation, I use the phrase "social media age" to refer to the period of web-based social technologies. This does not include technology systems like Usenet, which some believe was the earliest form of social media. Instead, this age begins in 1999 with the introduction of blogging platforms and includes Web 2.0 technologies being developed up to the present day. Although the Open Diary blogging platform was launched in 1998, blogging was not yet popular. Although the history of social media is fairly recent, I argue that social media is an extension of the long history of web technologies that were born out of the internet and cellular technology.

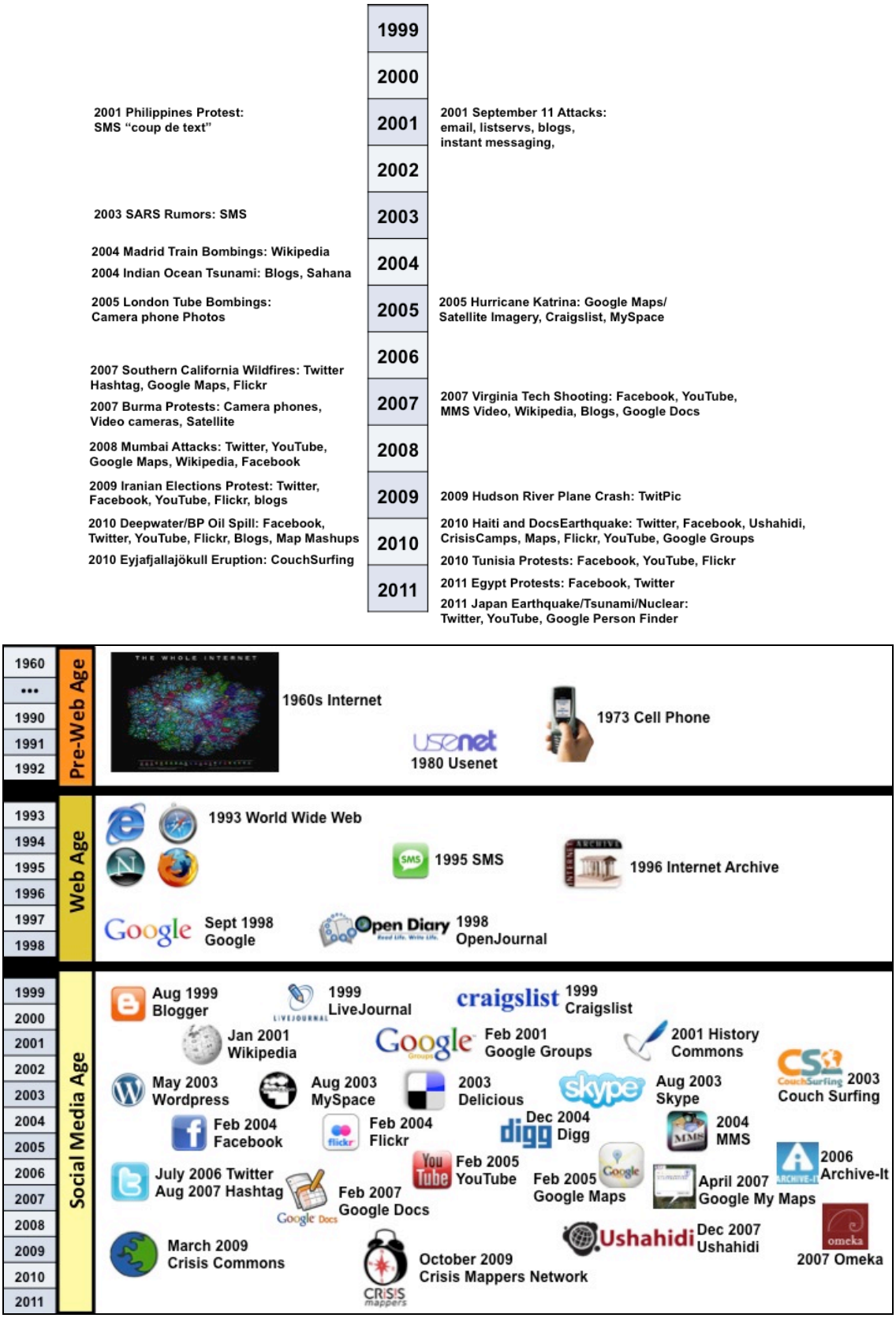

Figure 1: Top Timeline Shows Evolution of Networked ICTs, Bottom Timeline Shows Crises that Exhibited Notable Uses of Social Media

A wide variety of social media services were initially chosen as research sites. To be strategic given the possibilities, this research focuses on ICTs that were launched in the social media age as well as those that received high convergence during recent crisis situations (i.e., English Wikipedia,[3] Facebook,[4] Twitter,[5] Flickr,[6] YouTube,[7] and blogs). Delicious[8] and Digg[9] were also included since these were social media services that were popular in the earlier part of the social media age. Within these social media services, the focus was on finding social media artifacts pertaining to crisis remembrance activities that led to online social action. This research also focused on "remediation" activities, where one medium is represented in another by "borrowing, adapting, sampling, or remixing" existing content and forms to create "new expressions, new relationships, and new content" (Bolter and Grusin, 1999). This is similar to the concept of "media convergence," where the merging of different computer-mediated communications create "an inter-networking of networks" (Jones, 1999, p. 22). Instead of focusing on one particular social media service, this dissertation examined multiple social media services that were strategically chosen to better understand how these services collectively facilitate new forms of heritage practices in the crisis domain.

Spatiotemporal tools were also of interest because they illustrated innovative ways of organizing and visualizing crisis information (i.e., map mashups, Google My Maps,[10] Ushahidi,[11] SIMILE Widgets[12]). The focus was primarily on services that facilitated participatory forms of spatiotemporal mapping of crisis data to investigate their role in managing and presenting crisis

[3] http://en.wikipedia.org
[4] http://www.facebook.com
[5] http://twitter.com
[6] http://www.flickr.com
[7] http://www.youtube.com
[8] http://www.delicious.com
[9] http://digg.com
[10] http://maps.google.com/help/maps/mymaps/create.html
[11] http://www.ushahidi.com
[12] http://www.simile-widgets.org

memories. Focusing on map interfaces was a pivotal way to connect emerging crisis mapping activities with cultural heritage issues surrounding curation, given that maps are intrinsically intertwined with the social construction of culture (Harley, 1989; Wood, 1992). Innovative forms of digital mapping also "help to reveal the intersections between cyberspace and geographic space" providing insights on the spatial nature of online social interactions (Dodge, 2005, p. 120). This research also involved examining websites that facilitated new forms of digital history practices, namely the open source web-publishing platform called Omeka[13] intended for creating digital archives and memory banks (e.g., The September 11 Digital Archive[14] and Hurricane Digital Memory Bank[15]).

Within each of these social media services, I examined the features and the emerging social media practices within them (e.g., folksonomic tagging, creation of groups, and the emergence of hashtags). My goal was to examine the design of these services and the "meta-design" practices that emerged within them (Fischer and Giaccardi, 2006). Sengers et al.'s (2005) "reflective design" question also guided this line of thinking: "What values, attitudes, and ways of looking at the world are we unconsciously building into our technology, and what are their effects?" (p. 49). This question informs how one might examine the heritage of social media by looking at the meanings and values built into the design of these new media technology. Examining the values embedded in the design of social media helped to illuminate why people use social media for crisis situations as well as how these values influence the curatorial practices taking place online.

The concept of "curation" emerged early on in this research. Curation is an active and intentional process of making choices about what is most meaningful to preserve and pass on to

[13] http://omeka.org
[14] http://911digitalarchive.org
[15] http://hurricanearchive.org

future generations. It has also become an interactive, sociotechnical phenomenon. ICTs like social media are making what some refer to as intangible heritage (e.g., stories, values, and practices) more tangible; the act of digitization makes this type of heritage tangible engough to curate it online in a distributed way. In other words, ICTs make heritage worthy phenomenon, like a story or a message, tangible by making it a digital artifact that can be copied, remixed, re-presented, or rather curated using social media tools.

Curation is typically associated with cultural heritage institutions, where curators take on the role of keeping heritage alive by deciding what memories to preserve and how to preserve them. Curation is also a concept increasingly used in the context of information overload in the digital age and in the social web world. What I argue is that the activities embedded in the design of social media services support tasks associated with curation (e.g., collecting, organizing, storytelling, etc.). The link I make between heritage and curation is that curation is the methodological system for keeping heritage alive by preserving the memories within it. Social media have begun to facilitate distributed forms of curation facilitating a more participatory process of preserving heritage. This early indication that curation was an important theoretical construct for my research on heritage led me to investigate curation as a professional discipline as well as a popularized term in the social media landscape. What this dissertation suggests is that designers of ICTs like social media now have the opportunity and perhaps the responsibility to decide *how* memories are kept alive—or rather curated—because the values they embed in the design of their technology may ultimately shape what kind of heritage that develops and how this heritage is sustained.

1.3 Contributions

This research informs the fields of information science, heritage studies, and crisis informatics and offers three contributions: (1) expanding the concept of heritage as a living and participatory phenomenon with the term *grassroots heritage*; (2) providing descriptive examples of how *social media sustain the living heritage* of historic crises; and (3) offering a theoretical model of *socially-distributed curation* to inform the design of future social technology. In doing so, this dissertation integrates social, technical, and informational concerns to better understand the long-term cultural issues that lie at the intersection of heritage, social media, and crisis.

1.4 Overview of the Dissertation

In addition to this chapter, the dissertation contains nine additional chapters. Chapter 2 presents literature from three different fields of study—memory and heritage, disasters and crisis informatics, as well as cultural design methods and the foundations of web-based technology—that make up the interdisciplinary foundation of this dissertation. Chapter 3 explains the research questions that guide this dissertation and the research design that was employed. Chapter 4 presents the methods used to conduct the studies in Part 1 involving the investigation of crisis narratives. Chapter 5 presents the methods used to conduct the studies in Part 2 involving the critique of curation as a concept. Chapter 6 presents findings from a survey of social media presence for 111 crisis events conducted in Part 1. Chapter 7 discusses the narratives that emerged in the social media landscape for the 1984 Bhopal gas leak. Chapter 8 discusses the narratives that emerged in the social media landscape for the 2001 September 11 attacks. Chapter 9 explains the findings from the studies conducted in Part 2 that critiqued the concept of curation and then offers a theoretical model of socially-distributed curation. Chapter 10 summarizes the major findings and a discussion of the final contributions of this work.

CHAPTER 2
LITERATURE REVIEW

The dissertation brings together literature from three different fields of study. Section 2.1 reviews literature pertaining to socio-cultural memory and heritage informatics. Section 2.2 reviews literature from hazards and disaster research as well as crisis informatics. Section 2.3 reviews literature from the field of human-computer interaction (HCI) pertaining to cultural design methods and then discusses the values embedded in the design of the web, Web 2.0, and social media services. The literature review weaves together interdisciplinary perspectives from these three fields as the basis for understanding the cultural application of social media in the crisis domain.

2.1 Socio-Cultural Memory and New Heritage

Memory studies is a nascent field drawing from "cultural studies, media studies, communication and visual culture" to examine the social, cultural, cognitive, political, and technological shifts in memory practices (Sturken, 2008). It is a multidisciplinary field that encourages a long-term perspective to inform the design and development decisions being made around "technologies of memory" (Van House and Churchill, 2008). This dissertation links issues of socio-cultural memory to heritage concerns. *New heritage* analyzes the affordances and implications of new media that support the re-presentation, management, and dissemination of cultural heritage in ways that go beyond conventional museological approaches (Kalay et al., 2008). This field reconsiders the role of the public by recognizing how digital media is allowing viewers to actively participate in expressing and understanding cultural heritage. This section begins with a review of literature discussing socio-cultural memory and collective memory in the digital age to lead into literature that re-theorizes heritage as a living, ongoing process.

2.1.1 Socio-Cultural Memory in the Digital Age

The field of HCI typically addresses issues of digital memory and its socio-technical practices at different scales of human memory. The earliest memory studies in HCI focused on *group memory* and *organizational memory* in corporate settings to ensure that expert knowledge was preserved and shareable for the benefit of others at the workplace or those who may work there in the future (e.g., Ackerman, 1998; Berlin et al., 1993; Moran et al., 1997). Technological tools that support *personal information management* and *lifelogging* has also long received attention in HCI (e.g., Gemmel et al., 2006; Jones and Teevan, 2007; Sellen et al., 2007). When HCI research expanded into the domestic sphere, *family memory* emerged as an important topic that led to the design of memory systems for the home (e.g., Kirk and Sellen, 2010; Petrelli et al., 2008; Stevens et al., 2003). The community informatics field concerns itself with *community memory* by building community archive systems that support the process of collecting, representing, disseminating and enriching memories among members of a place-based community (e.g., Agostini et al., 2002; Flinn, 2007; Olsson, 2009). However, "technologies of memory" issues at a *collective and cultural level* have been under examined in HCI (Van House and Churchill, 2008). This dissertation fills this gap as well as brings together discussions of collective memory to heritage concerns. **What I argue is that individual memories that get assembled on a societal scale shape cultural orientation. Since new contributors continually reinterpret these memories over time, this collective memory becomes a part of a society's living heritage.**

Collective memory, a term first coined by Halbwachs (1925/1992), is generated when people create shared experiences and continually feed this memory back to each other. Collective memory is inherently a part of the social arrangements that allow people to work together in society because "it is in society that people normally acquire their memories. It is also in society

that they recall, recognize, and localize their memories" (Halbwachs, 1992, p. 38). Therefore, what Halbwachs argues is that a collective context is necessary for human memory to function at its fullest because individuals rely on others to be able to remember persistently and coherently over time. Sharing memories can also be seen as "an act of public contribution" that helps to externalize the significance of individual memories (Jesiek and Hunsinger, 2008).

A long-term, multi-temporal perspective is also associated with collective memory, which becomes a critical link to heritage concerns. In terms of the multi-temporality of mediated memories, van Dijck (2007) argues, "*mediated memories are the activities and objects we produce and appropriate by means of media technologies, for creating and re-creating a sense of past, present, and future of ourselves in relation to others*" (p. 21). In terms of the multi-temporality of heritage, Giaccardi and Palen (2008) state, "collective engagement with heritage happens over time, with meaning evolving as the past becomes more distant and the present changes." Friedman and Nathan's (2010) "multi-lifespan" perspective is one approach to addressing how we might preserve knowledge across generations when designing information systems. The phrase *prospective retrospective*—that is "imagining now what we will want to remember in the future"—is another way to describe the multi-temporal aspect of memory (Churchill and Ubois, 2008; Van House and Churchill, 2008). Although this tends to be difficult to do in practice, since people have a hard time anticipating something that will have future value, there are shared experiences in society that make the prospective retrospective approach more apparent and intuitive.

Major crises and disasters are one of these rare occasions where a wide spectrum of society engage in prospective retrospective memory practices, sometimes while the crisis is still unfolding. Therefore, the crisis domain is a ripe area to investigate prospective retrospective

practices because there is a strong urge to immediately record the event because of its historic implications for the future. Also, long after the emergency period, there is always a segment of the population who try to urge the wider public to remember—or rather not forget—historic crises in the context of present day concerns. Hence, **considering the past, present, and future inseparably is a critical aspect of managing collective memories for heritage purposes**.

Digital memory devices are making it easy to capture massive amounts of information. The problem that people now face is that it is difficult to organize and preserve these digital memories over a long period of time because of "curatorial overload" (Van House and Churchill, 2005 . People now have to be more attentive to the changes in technology as well as changes in media formats to ensure the longevity of a memory mediated by digital technology. Sellen and Whittaker (2010) discuss the challenges that emerge when relying on digital devices for lifelogging purposes, where one tries to digitally capture nearly every moment in one's life. One insight they offer is the importance of being selective rather than exhaustive by capturing everything. This is a critical issue for memory practices at the collective level because it may not be possible to archive everyone's memories; instead, the focus should be on identifying collective memories that are most pertinent while including the one's that are less heard. Another insight they offer is recognizing that memory technology and the digital artifacts that they produce cannot be seen as substitutes of one's own organic human memory; they are only cues. What I argue in this dissertation is that ICTs like social media are allowing people to share collective memories in a public and easily accessible way, but these memories should not just be passively consumed. People must continually recreate, revise, and remix these collective memories to ensure that the ones worth sharing stay alive over time.

Collective memories are often times "prosthetic memories"—memories that one did not directly experience—handed down to us through mass media (Landsberg, 2004). In HCI, "prosthetic memories" are memories created by the use of technology, such as paper, sticky notes, and digital memory devices (Kalnikaité and Whittaker, 2007). What is beginning to emerge in the digital age is an amplification of both types of prosthetic memory, which is fundamentally changing the way individuals and society as a whole relate to history and our stories. In other words, it is becoming easier to access and search prosthetic memories generated not only fifty years ago but also five minutes ago. This raises questions as to what kinds of new memory practices are emerging when our history is literally at our fingertips when we browse the web.

Cultural institutions and mainstream media have historically had considerable control over the management of history and heritage matters, since "public memory was constructed and disseminated for the people but not by the people" (Haskins, 2007). Also, the duties of professional curators and historians traditionally give them the institutional power to shape the public and collective memory by determining what objects to preserve and, most importantly, deciding whose stories get told. However, Cohen and Rosenzweig (2005) emphasize in their book, *Digital History*, that "networked information technology can allow ordinary people and marginalized constituencies not only a larger presence in an online archive, but also a more important role in the dialogue of history." In other words, current ICTs are enabling the public to not only construct and disseminate memories for themselves, but also share and discuss what memories are worthy of preserving.

Memory practices and especially those that produce collective memories are an important aspect to heritage. What I argue in this dissertation is that collective memories generated at a

societal level and shared over time across generations assume social and cultural significance and become a matter of heritage.

2.1.2 New Heritage and Its Living Aspects

Heritage is typically defined as either being *tangible* (e.g., artifacts, sites, monuments, buildings, etc.) or *intangible* (e.g., oral traditions, rituals, performances, etc.). However, heritage is a complex matter, where its evolving understanding questions the boundaries between tangible and intangible. There continues to be an ongoing debate about the (in)tangible division among heritage scholars and professionals. The emphasis towards the tangible aspects of heritage tends to be a western account of heritage and an artifact of how archaeologists historically view culture—made up of materials that need to be excavated and preserved just as it existed in the past (Smith and Waterton, 2009). Although cultural institutions like the United Nations Educational, Scientific and Cultural Organization (UNESCO) have begun to emphasize the importance of intangible heritage, some heritage scholars still argue that a reframing and re-theorization of heritage is needed.

The new treatment towards heritage is to define it more broadly as the instantiation of a social and cultural process reflecting a complex array of artifacts, customs, values, and meanings embedded in a changing contemporary context (Silberman, 2008; Smith, 2006; Smith and Waterton, 2009). For example, Smith (2006) re-theorizes heritage by stating, "it is all intangible," since "value and meaning are the real subjects of heritage" (p. 3). She further explains that heritage is fundamentally the result of a meaning-making process, which engages us in acts of remembrance, communication, and the passing on of knowledge and memories. In other words, heritage is an intangible process of identifying, negotiating, rejecting, and reaffirming social and cultural values (Smith and Waterton, 2009). Moreover, heritage is a

process that influences the production of identity, power, and authority in a society (Harvey, 2001).

This process-oriented treatment of heritage reflects how others interpret heritage as a living entity and as a form of social action because of the fluid and changeable nature of heritage. According to Kirshenblatt-Gimblett (2004), heritage entails the task of "sustain[ing] the whole system as a living entity" that goes beyond just collecting and preserving artifacts (p. 53). This view of heritage shifts the focus away from a particular person having authority over managing a cultural collection, and instead moves towards sustaining a social system where multiple people actively accept the role of safeguarding cultural practices to ensure its transmission to a new generation of people by treating *heritage as living heritage*. Additionally, Byrne (2008) offers a new model that treats *heritage as social action* arguing that people should not be seen as "inheritors or passive recipients of culture but as active owners and modifiers of culture" (p. 162). Heritage is ultimately about sustaining a living process that continually tries to reproduce what is of value and social significance. This is the type of engagement that justifies and encourages the need for publicly sharing crisis-related memories, as they are often more authentic, relevant, and meaningful accounts. This interactive, two-way communication process of supporting heritage practices is the "essence" of heritage, as described in the following statement by Silberman (2008):

> *"That is the unicorn we are pursuing – a social attempt to understand where we are in time, what brought us to this point both in tragedies and triumphs, and what parts of it we should pass down to our children as a link in the continuing chain. In a word, it is an overall understanding of why the Past is important no less than what it is" (p. 90).*

As our memories and histories are increasingly being preserved digitally and becoming more readily accessible to the wider public, we must rethink the notion of "heritage" and design

technologies that anticipate ICT-enabled heritage production in this increasingly participatory culture created by social media.

Thinking of heritage in these terms is critical to advancing the idea of "digital heritage" that goes beyond conventional museological concerns of digital reconstruction and preservation of the tangible and material. Attempts to reframe the digital heritage discourse are often in response to virtual heritage work using techniques involving 3D modeling, graphics, and animation to diligently reconstruct and preserve physical heritage sites and artifacts. As an example of such research, the Microsoft Research India Digital Heritage project uses advanced visualization technologies like Photosynth and HDView to create compelling 2D and 3D end user experiences that weave together a variety of archaeological data (Sankar, 2009).

Recent publications addressing culture and the politics of heritage practice in an age of new media technologies further challenge the distinction between tangible and intangible heritage. For instance, the anthology *Theorizing Digital Cultural Heritage: A Critical Discourse* edited book (Cameron and Kenderdine, 2007) and the *New Heritage: New Media and Cultural Heritage* edited book (Kalay, 2008) both broaden the definition of cultural heritage in the digital media landscape by addressing its complex relationship to social, political, and economic issues. In the editorial of a recent special issue of the *International Journal of Heritage Studies* on matters of heritage and new media, Giaccardi et al. (2008) elaborate on how new media do not merely preserve and express the cultural heritage of existing material artifacts and sites. Instead, new media also stimulate novel forms of cultural interpretation and production, thus allowing the intangible heritage to be more successfully captured and represented. This tends to enable new categories of cultural objects to be imagined and created.

Similar to the challenges facing the media industry, cultural institutions are starting to examine the affordances of social media to adjust their communication practices with the public. Museum institutions traditionally view "knowledge transmission as a linear communication process in which information is transferred from an authoritative source to an uninformed receiver," a communication model that is both jeopardized and strengthened by ICTs (Giaccardi, 2006, p. 32). The challenge with integrating social media arises from *re-examining* and *redefining* "both the nature of authenticity and the role of interpretation" when involving people outside of the institution (Silberman, 2008, p. 89). Museums and national libraries are starting to use social media as a way "to shift curatorial communication from one-to-many or peer-oriented models to a many-to-many communication model, whereby curatorial knowledge acts as a hub around which an online community of interest can build" (Russo et al., 2008, p. 23). Russo and Watkins (2007) offer a framework called *digital cultural communication* in an effort to expand the "curatorial mission" in a way that goes beyond exhibitions to the "remediation of cultural narratives and experiences" (p. 149). This framework is intended to provide "a conceptualization for how audiences can 'make meaning' with and through the institution in order to create new networks of shared creation and distribution" (p. 162).

In the museum context, Freedman (2000) predicts that the future role of museums "lies in legitimizing information and information processes and in being an advocate for knowledge as the province of the people, not the sole property of the great institutions" (p. 303). Similarly, Giaccardi (2006) discusses how the Virtual Museum of the Collective Memory of Lombardia (MUVI) had a similar mission of allowing community members to participate in the "cultural dissemination" process by "contributing, sharing, and comparing artifacts and memories" (p. 34). Not only did it encourage and stimulate people to tell their own stories and listen to other

people's stories, but it also encouraged people to make "connections between the tales" to tell a larger story. It is through the collective production of this larger story that facilitates meaning making and making this larger story relevant to present day concerns.

Truly, this active engagement by the visitors is what has been missing in traditional exhibits. Although this approach has always existed, particularly when designing activities for children at museums, ICTs give new light to creating stimulating exhibition environments that engages visitors to become participants at multiple levels that go beyond just being a passive spectator. According to Kalay et al. (2008), digital media technologies in the heritage context "puts much of the authority—and responsibility—for constructing the narrative in the hands of the viewer" (p. 7). This shift towards a two-way communication model between museum professionals and its visitors makes the opinions and narratives of the visitors even more significant to their collections. This shift allows the role of the visitor to expand with duties often held by curators, especially in terms of interpreting the artifacts in the collection. Although current public engagement approaches towards preserving history are expanding, there still is a need to design tools that go beyond just collecting stories from the wider public to supporting "insight" and "interpretation" from the public as well (ACLS, 2006). Such tools are critical when preserving and interpreting historic phenomena like crises and disasters, which tend to generate multiple interpretations.

2.2 Anthropology of Disaster and the Crisis Informatics Field

The *hazards and disaster research* community involves multiple stakeholders including practitioners, policy makers, and researchers from multiple disciplines (e.g., sociology, anthropology, psychology, geography, political science, economics, decision science, public health, and emergency management). This subsection draws from the anthropological research

on hazards as it relates to heritage concerns. *Crisis informatics* draws from disaster social science literature to inform information science research (e.g., Palen and Liu, 2007; Palen et al., 2009). It takes an integrated perspective on the technical, social, and informational aspects of crisis to facilitate socially- and behaviorally-informed ICT development and deployment for non-routine situations (Palen et al., 2009). This section begins with a cultural approach to investigating disasters and then discusses the literature on how ICT-enabled citizens participate during times of crisis, which is the basis for looking at their use beyond the emergency period.

2.2.1 Anthropological Research on Hazards: Disasters as a Social Process

Disasters are living, social laboratories (Garcia-Acosta, 2002; Oliver-Smith, 1996; Tierney, 2002) that help to reveal the critical preexisting situations that need attention. Therefore, they become critical turning points in our society that expose deeply rooted vulnerabilities but with an opportunity to foster community resilience and social change. They arise from larger social processes interacting with natural, technological, and/or human-induced hazards. Disasters also tend to be non-routine situations that expose fundamental societal issues and highlight ongoing power struggles that face society. A historical perspective is needed to weave these cultural histories together and synthesize how these disasters are diachronic phenomena that still have lessons that need to be learned (Garcia-Acosta, 2002).

People are easily transfixed by the immediate devastation and social disorder produced by the impact of a disaster, but their attention fades after the emergency period is over. Disaster anthropologist Oliver-Smith (2002) argues, "part of the problem is that disaster is often considered an event rather than a process" (p. 23). Insread, disasters should be viewed as "multidimensional because they are both physical and social event/processes…[that are] socially constructed and experienced differently by different groups and individuals, generating multiple

interpretations of an event/process" (p. 25). Additionally, Oliver-Smith and Hoffman (2002) assert that disasters should more accurately be viewed as "processual phenomena rather than events that are isolated and temporally demarcated in exact time frames" (p. 3). They suggest that by viewing disasters as *processual*, the "historically produced pattern of 'vulnerability,' evidenced in the location, infrastructure, sociopolitical organization, production and distribution systems, and ideology of a society" becomes more visible (p. 3). Recognizing these patterns of vulnerability strengthens a society's capacity to anticipate, mitigate, cope with, and recover from the impact of crisis processes. Unfortunately, contemporary society tends to create and "design future disasters" when we ignore or perpetuate physical, social, and technological vulnerabilities (Mileti, 1999).

Disasters are also circumstances that result in extraordinary public involvement, where members of the public spontaneously engage in humanitarian relief through civic action and social solidarity (Mileti, 1999). The public's response to disasters is often "overwhelmingly adaptive, prosocial, and aimed at promoting the safety of others and the restoration of ongoing community life" (National Research Council, 2006, p. 135). These informal response efforts often lead to the development of *emergent groups* made up of "private citizens working together in the pursuit of collective goals" (Stallings and Quarantelli, 1985, p. 94). Disaster researchers have long documented how individual citizens, community-based organizations, and emergent groups self-organize to overcome adversity and address unmet needs during crisis situations through improvisation of their skills and emergent adaptations of their available resources (Clarke, 2002; Fischer III, 1998; Tierney et al., 2001; Tierney and Quarantelli, 1989).

The urge to help those in need in one's community and abroad during the emergency period has become commonplace, and disaster research tends to focus its concerns during this

period. Yet, according to Oliver-Smith (1996), "the issue of long-term social change has received significantly less attention than more immediate behavioral and organizational issues" (p. 312). **Therefore, this dissertation intends to fill this gap by investigating the public's involvement outside of the emergency period by examining the living heritage of historic crises in the social media landscape, which is largely uncharted territory in disaster research and crisis informatics**.

2.2.2 Crisis Informatics

During times of crisis, affected publics, emergency responders, government officials, relief organizations, and volunteers search for as well as provide information as a way of participating in the crisis response milieu. Now these information seeking and providing activities are increasingly taking place online through ICTs like social media (e.g., Palen and Liu, 2007; Palen et al., 2009; Starbird and Palen, 2011; Vieweg et al., 2010). Current research attention in the area of crisis informatics tends to focus on ICT-based activity during the emergency phase including the immediate pre- and post-impact phases of a major crisis or disaster (e.g., Hagar and Haythornthwaite, 2005; Landgren, 2006; Palen et al., 2009; Qu et al., 2009; Starbird and Palen, 2011; Vieweg et al., 2010). Research focusing on social media use in the crisis domain is still nascent with the earliest work beginning in my research lab between 2005 and 2007 (Palen and Liu, 2007). It is not surprising that more research attention has focused on social media use during the emergency phase, since innovative uses have occurred during this particular disaster phase to help coordinate disaster management efforts, and such uses are increasingly popularized and reported by mainstream media.

For example, blogs were one of the first notable social media services that were used to support crisis communication activity. The aftermath of the September 11, 2001 terrorist attacks

was a key turning point in how people used the web during a crisis. Halavais (2002) points out that this event "generated the most traffic to traditional news sites in the history of the Web," but Halavais also states that "equally as important was the fact that many non-news sites were turned into conduits for information, commentary, and action" giving prominence to "do-it-yourself journalism" through blogs (p. 26). Schneider and Foot (2004) also discuss how people used the web as a crisis communication tool to enable *coordination*, *information sharing*, *assistance*, *expression*, and *advocacy* at peer-to-peer and community levels.

There continues to be an on-going effort by historians, archivists and other cultural heritage professionals in the United States (US) to collect and preserve the historical record of significant crises in the US. With advances in web technologies, there is a growing practice to use the internet and particularly Web 2.0 technologies to collect and preserve history online through virtual museums and digital memory banks. In the context of digital archives, Jesiek and Hunsinger (2008) note that without the physical limitations of traditional "brick and mortar" archives and museum spaces "the politics of archival preservation—and thus public memory—becomes partially unbound," but the decisions surrounding what to include in the archives are "transformed by the politics surrounding the underlying technologies of memory" (p. 190). That is to say, although an indefinite amount of artifacts can be collected and stored using digital technologies, the use of certain technologies will determine what and how artifacts are collected and preserved. The urge to document and share one's memories to the wider public has always existed, but it is unclear as to what happens to the digital memories of a historic crisis five or even ten years after it occurred. Therefore, it is important to consider how technologies of memory that are being used to make and preserve history are designed.

2.3 Cultural Design Methods and Web 2.0 Values

When considering the new treatment of heritage as a sociocultural process that is primarily about value and meaning, I found it necessary to acknowledge the importance of cultural design methods in HCI, which tends to draw attention to the values embedded in the design of technology. Therefore, I begin this section with a review of design methods that encourage a more reflexive approach to technology design. Then, I discuss some of the values embedded in the design of the web, Web 2.0, and social media, and discuss the emerging sociotechnical practices that have become the foundation of participatory culture.

2.3.1 Cultural Design Methods

Three types of design methods from the field of HCI guided this research project. First, the ethos behind *participatory design* (e.g., Bødker, 1991; Greenbaum and Kyng, 1991; Kristensen et al., 2006; Muller, 2002; Schuler and Namioka, 1993) of emphasizing users' critical role in designing computer systems links to the behaviors emerging from the design and use of social media. **Social media users continually influence the design of social media directly and indirectly, since social media are designed by users and are perpetually adapted based on users' participation and feedback**. For example, user-generated linguistic tools (e.g., #hashtags, @reply, and retweeting conventions) emerged within Twitter that ultimately led to design specifications implemented by Twitter over time. The design and use practices emerging from social media informs the "third space experiences" that Muller (2002) discusses when applying the concept of "hybridity" to participatory design.

Second, the purpose behind the *cultural probes* method (e.g., Gaver et al., 1999, 2004; Boehner et al., 2007; Graham et al., 2007; Lucero et al., 2007) initially guided this research. Generally, cultural probes contain a set of artifacts and evocative tasks. Gaver et al. (1999)—the

originator of cultural probes for technology design purposes—defined probes as a way to "provide opportunities to discover new pleasures, new forms of sociability, and new cultural forms" (p. 25) by provoking "the users to consider their environment in a new way" (p. 26). Therefore, the main purpose of the probes method is to open, not close, new spaces for technology design (Gaver et al., 1999). Given that digital heritage topics are nascent in HCI, the goal of this research is to provide a broader interpretation of heritage as a way of opening the design space for future work on digital heritage.

Third, the principles behind *reflective design* (Sengers et al., 2005), *empathic design* (Wright and McCarthy, 2008), and *value-sensitive design* (Friedman et al., 2006) highlight the need for maintaining an empathic relationship between the designers and users as well as the need for being reflective about the values embedded in the design of technology. This awareness of the designer's ability to embed values in technology link to ways of understanding the heritage of technology, in this case the heritage of social media. It is this perspective that encouraged me to also investigate the values embedded in the design of social media and how they correlated with the values and practices emerging from the use of social media. This type of inquiry provides **insight into what human values are consciously and unconsciously being embedded into the design of social media, since these values constitute the heritage of social media and more broadly the web**.

2.3.2 Foundations of the Web and Web 2.0 in the Lead Up To Social Media

To understand the values embedded in the design of the web, one must understand the historical foundations of the web in order to recognize its full potential. Tim Berners-Lee's (1999), the inventor of the web, explained his intentions when designing the web in his book *Weaving the Web: Weaving the Web: The Original Design and Ultimate Destiny of the World*

Wide Web by its Inventor. Berners-Lee's vision was to provide "new freedom," away from the shackles of "hierarchical classification systems" (p. 1-2). His imagination led to the idea of having a system that allowed anything to link to anything with the possibility of having "a single, global information space" (p. 4). Berners-Lee further describes his design intentions in the following excerpt:

> *"The Web is more a social creation than a technical one. I designed it for a social effect—to help people work together—and not as a technical toy. The ultimate goal of the Web is to support and improve our weblike existence in the world" (p. 123).*

His vision and his values are clearly embedded into the design of the web. It is through his social and technical understanding of the technology and the potential it has in society, that we now have the ability to link things together almost infinitely and create common understandings with people across the world.

Web 2.0 is a concept that is still not clearly defined but encompasses certain principles under the umbrella phrase "the web as a platform." The notion of Web 2.0 is less so much of a technical specification; instead, this term focuses on the shift in how people are using web-based applications through democratic means, thus creating the participatory, "read-write" web. Tim O'Reilly (2005b) addresses some of the principles and design patterns that appear in Web 2.0 technologies and offers the following definition of Web 2.0:

> *"Web 2.0 is the network as platform, spanning all connected devices; Web 2.0 applications are those that make the most of the intrinsic advantages of that platform: delivering software as a continually-updated service that gets better the more people use it, consuming and remixing data from multiple sources, including individual users, while providing their own data and services in a form that allows remixing by others, creating network effects through an 'architecture of participation,' and going beyond the page metaphor of Web 1.0 to deliver rich user experiences."*

In other words, the web is being used as a platform for providing services often to niche communities and those on the edges, thus embracing the "long tail effect" (Anderson, 2006). Web applications are now becoming ongoing services in "the perpetual beta" mode where the users become real-time testers of new features (O'Reilly, 2005a). The competitive advantage has now shifted towards creating "data-driven" applications by owning unique sources of data that can be licensed out, which refers to the "next Intel Inside" strategy (O'Reilly, 2005a). Moreover, the shift towards a more democratic model within the Web 2.0 framework is harnessing "network effects," creative reuse of data, mass collaboration, and "collective intelligence" giving rise to *hyperlinking*, *folksonomy*, *wisdom of crowds*, the *remix culture*, *mashups*, *loosely-coupled systems*, and *syndication* (O'Reilly, 2005a). Mashups are web applications that typically use openly published Application Programming Interfaces (APIs) to access, extract, and recombine content from more than one source into a single integrated tool. Furthermore, advancements in ICTs as well as ubiquitous computing technology allow these web services to become even more accessible through other devices, thus opening up the possibility for new forms of interaction (O'Reilly, 2005a).

One blogger draws attention to the following five behaviors that differ from past industrial media technologies: *reach*, *accessibility*, *usability*, *transparency*, and *recency* (Haven, 2008). Social media services facilitate peer-to-peer forms of communication with the ability to reach "a global audience" through new forms of networking across geographical boundaries. These technologies are also more accessible due to their low cost and availability in the mainstream market. At the same time, they are easy to use without requiring "specialized skills" or technical training. People are also openly sharing information about a wide variety of topics allowing personal content to become more "transparent." Furthermore, these types of many-to-

many services online enable immediate publication and participation without the need to go through gatekeepers that typically exist in top-down, institutionalized communication models.

Social media are redefining the way people publish information, engage in discussions, and form communities. In this dissertation, I focus on social media that are web services (e.g., blogs, wikis, social networking sites, and media sharing sites) and mobile devices (e.g., mobile phones, camera phones, and digital cameras). **The primary ethos behind social media is having the power to express and cultivate a more participatory culture through social engagement**. The definition of social media continues to evolve as developments in software applications and Web 2.0 services advance.

The current impact of social media closely relates to the *prosumer* and *Pro-Am revolution*, the *network society*, and the *public journalism* movement, which is giving rise to a more participatory culture. The term *prosumer*, first coined by Toffler (1980) and later elaborated by Tapscott (1996) and Tapscott and Williams (2006), describes the blurring gap between producers and consumers "where customers participate in the creation of products in an active and ongoing way" (Tapscott and Williams, 2006, p. 126). Similarly, the *Pro-Am revolution* is also blurring the dichotomy between *professionals* and *amateurs* through bottom-up self-organization (Leadbeater and Miller, 2004).

As we shift from *consumer cultures* (Postman, 1985) to *cultures of participation* (Fischer, 2002, 2010; von Hippel, 2005), the process is somewhat reverse among "democratic cultures" as seen in Fischer's (2009) "Model-Democratic" diagram shown in Figure 2. The dynamic engagement of passive users becoming *prosumers* through *informed participation* (Brown et al., 1994) facilitates a complex ecosystem of interactions involving people with ranges of motivation to participate. In the Model-Democratic diagram, it depicts how there tends to be a larger amount

of contributors by both experts and prosumers generating "large information repositories" due to "weak input filters." We now face the "challenge of making sense of large information repositories" like the web, but Fischer (2009) points out that to address this challenge we need to "exploit existing and develop new output filters." However, it is unclear how people are currently coping with existing systems to overcome these information management problems. This dissertation attempts to provide descriptive details of how networked technologies like social media are being used to not only filter through these large information streams, but also curate these information streams to extract relevant and meaningful information and re-present it in a compelling way.

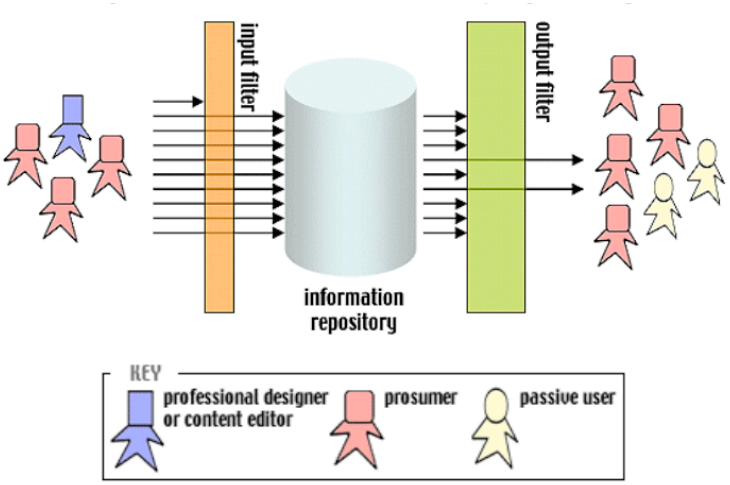

Figure 2: Model-Democratic Diagram (Fischer, 2009)

The *network society* concept, first coined by van Dijk (1991) and later elaborated by Castells (1996), has been increasingly used to explain the societal shift towards a network model due to advancements in ICTs. In Hiltz and Turoff's (1978) book *The Network Nation*, they predict that computer-mediated communication would revolutionize society all over the nation through a network approach. Benkler (2006) makes similar arguments using the term *networked information economy* to describe the radically "decentralized" and "distributed" forms of mass

collaboration "socially produced" by ICTs. With the rise of *prosumers* and network-based communications, the journalism profession has most notably been affected by this rising participatory culture. According to Bowman and Willis (2003), *public journalism* is "the act of a citizen, or group of citizens, playing an active role in the process of collecting, reporting, analyzing, and disseminating news and information" (p. 9). This type of journalism has also been referred to *citizen*, *grassroots*, or *do-it-yourself* journalism. Gillmor (2006) explains *grassroots journalism* as being "part of the wider phenomenon of citizen-generated media—of a global conversation that is growing in strength, complexity, and power" (p. xv). Ultimately, it is an emergent, self-assembling type of journalism where audiences are shaping the news and information to create a more informed citizenry. The journalistic practices of today in the social web world are arguably how members of the public are making history and shaping the living heritage of today.

2.4 Conclusion

This chapter reviewed literature from three different fields of study. The first section discussed issues related to socio-cultural memory and collective memory as a way of leading into literature that re-theorizes the idea of heritage. The second section explained the meaning of disaster from a historical perspective and reviewed studies in the area of crisis informatics. The third section presented three types of cultural design methods relevant to heritage issues in HCI and discussed the values embedded in the design of web and the sociotechnical practices emerging from the use of social media. This interdisciplinary literature review not only brings together perspectives to create new understandings but it also draws attention to the gaps in research that this dissertation fills. The next part of this dissertation explains on how this research project was designed to fill these gaps and offer contributions to these three fields of study.

PART I: RESEARCH DESIGN

Part I consists of three chapters that constitute the entire research design employed for this dissertation. Chapter 3 explains my research questions, the research methods I employed, and the methodological issues that arose from conducting online research. The diagram in Figure 3 provides an overview of the research design, which contains three parts. Briefly, Part 1 focused on investigating crisis narratives. Part 2 focused on critiquing the concept of curation and developing an initial conceptual model of curation. Part 3 focused on developing a theoretical model of curation.

Chapter 4 explains the research design for *Part 1: Crisis Narratives*, which consisted of a two-phase mixed methods approach to investigating the narratives emerging from the use of social media in the crisis domain. Phase 1 comprised of a study surveying the social media presence for 111 crisis events to understand the broader context of social media use in the crisis context. Phase 2 consisted of choosing four crises from the survey, and then conducting in-depth investigations to determine the type of crisis narratives emerging in the social media landscape. Findings from this two-phase study resulted in a set of five meta-narratives describing the living heritage of historic crises in the social media landscape.

Chapter 5 explains the research design for *Part 2: Critiquing Curation*, which comprised of a two-phase mixed methods approach to unpacking the concept of curation. Phase 1 consisted of qualitative studies examining the meaning of curation. Phase 2 consisted of applying the findings from these qualitative studies to develop an initial conceptual model of curation. This chapter also explains *Part 3: Developing a Theoretical Model*, where I assessed this initial model of curation for the purposes of developing a final theoretical model called socially-distributed curation.

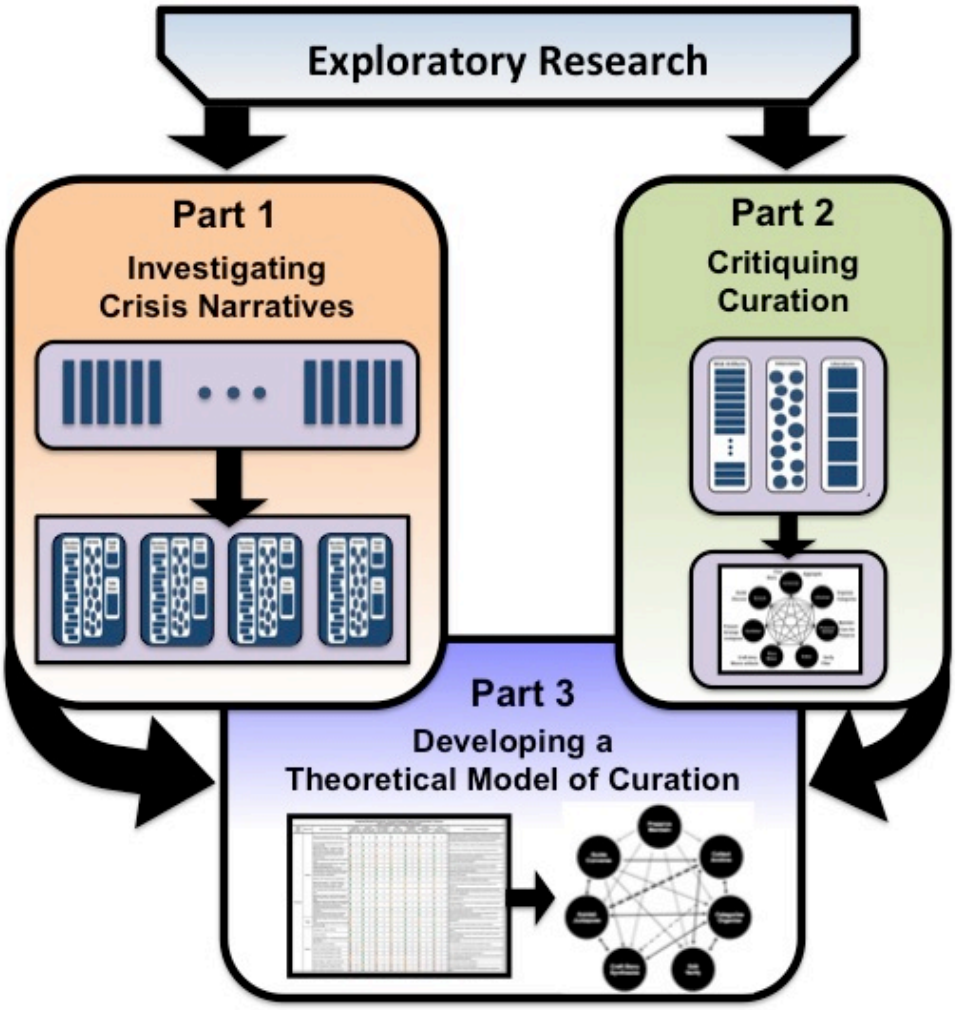

Figure 3: Overview of Research Design Consisting of Three Parts

CHAPTER 3
RESEARCH QUESTIONS AND DESIGN

Since heritage issues pertaining to social media use in the crisis domain is a nascent research topic, exploratory research was a necessary first step to developing research questions. This chapter describes how the exploratory research phase informed the development of two subsequent studies that were concurrently conducted. Section 3.1 presents my research questions and Section 3.2 explains the research design as depicted in Figure 3. Section 3.3 explains the methodological approaches to conducting online research and how that influenced the development of the three-part research design.

3.1 Research Questions

Unlike everyday routine events, major crises are perceived as historically significant events worth remembering and documenting as they unfold. Members of the public are increasingly and spontaneously using ICTs to capture, collect, and share crisis-related digital memories. But what happens to these memories after the emergency period of these events? This dissertation investigates the socio-cultural memory practices emerging from social media use for historic crises. **In other words, a) heritage is the subject or topic of my study, b) crisis is the domain of study, c) social media are the emerging mechanisms and features that I am interested in studying, and d) curation is an important sociotechnical phenomenon of interest that has arisen from this research.**

Broadly speaking, this dissertation attempts to reframe the meaning of "heritage" in the age of participatory culture. This research investigates how members of the public collectively remember and make meaning out of disasters over time to help strengthen community resilience to future crises, and how the process of social remembering is evolving in the networked age.

The following research questions guided the studies conducted in three parts:

Part 1A Research Questions: Are people using social media to digitally commemorate crises?
If so, what kinds of crisis commemoration trends are emerging?

Part 1B Research Questions: Why are people using social media to share crisis memories?
What kinds of narratives are emerging in social media?

Part 2 Research Questions: What activities are associated with curation?
What kind of curation is taking place through social media?

Part 3 Research Questions: Did the curation activities defined in Part 2 occur for the crisis narratives found in Part 1? How did they vary?

3.2 Research Design

To answer these research questions, the research was designed in three parts. Part 1 was an investigation of the kinds of crisis narratives emerging in the social media landscape. Part 2 was an investigation that involved critiquing the concept of curation and the development of a curation model. In other words, Part 1 focused on investigating what kinds of narratives are emerging from social media use in the crisis domain, while Part 2 focused on investigating how the narratives are created online and preserved through curation. Part 3 focused on conducting an assessment of the initial curation model developed in Part 2 by analyzing the curatorial activities that produced the crisis narratives found in Part 1.

3.2.1 Investigating Crisis Narratives

The Investigating Crisis Narratives study addressed Study 1A and 1B research questions consisting of a two-phase study, which is depicted on the left side of Figure 3. In Phase 1, I conducted a study surveying the social media presence for 111 historically significant crisis

events. The purpose of this survey was to understand the context of digital commemoration practices for different types of crises that took place over the past 50 years. In Phase 2, I conducted in-depth investigations of the narratives that exist in the social media landscape for four distinct crises (i.e., 1984 Bhopal gas leak, 2001 September 11 attacks, 2005 Hurricane Katrina, and the climate change crisis). Qualitative "virtual methods" (Hine, 2005) and automated collection techniques were used to collect and analyze these social media datasets for each crisis.

3.2.2 Critiquing Curation

The Critiquing Curation study addressed Part 2 research questions consisting of another two-phase study, which is depicted on the right side of Figure 3. The first study in Part 2 focused on unpacking the concept of *curation* in the social media context using qualitative methods. I conducted interviews, analyzed blog posts and other web artifacts discussing curation, and critically analyzed literature about the role of curators at cultural heritage institutions. In Phase 2, I developed an *initial conceptual model of curation* based on the findings in Phase 1.

3.2.3 Developing a Theoretical Model of Socially-Distributed Curation

To link the findings from the previous two studies, I assessed the initial conceptual model of curation by using it as a guide to examine a particular meta-narrative in one of the crisis cases. Conducting this assessment and drawing from my previous research work analyzing the curatorial activities that produced the crisis narratives led to the development of a *theoretical model of socially-distributed curation*.

3.3 Methodological Approaches and Issues

This section provides an overview of the methodological approaches that informed my research design and discusses the methodological issues that I had to consider when conducting research online in the crisis domain. Section 3.3.1 explains the online/offline aspect of studying cyberculture and the different ethnographic approaches to investigating virtual phenomena. Section 3.3.2 specifies why I chose a multi-method approach to studying the heritage of online social media culture in the crisis domain.

3.3.1 Studying Online Culture

Ethnography is used in cybercultural studies to provide empirical evidence of online behaviors for technology design purposes. Ethnographic studies of computer-mediated communication and online communities began in the early 1990s with the examination of Instant Relay Chat (Reid, 1991) and Usenet (Baym, 1993). Recent ethnographies of the internet and social networking sites, in particular, often discuss the relationship between online and offline contexts to inform methodological considerations. Kendall (1999) states, "Individuals exist and participate in off-line social contexts both sequentially and simultaneously with their on-line participation" leading to the creation of multiple representations of the individual (pp. 60-61). Also, users put the extra effort into extending online relationships into the offline world (Rheingold, 1993; Turkle, 1995). In other words, the online and the offline contexts configure each other, since interactions in the offline context can help to make sense of online phenomena (Slater, 2002). Forte (2005) explains the online/offline connection as a "wider and more profound social interaction…where people bring the offline into the online, with the hope of producing a new 'effect' that can then be taken offline and generate new realities on the ground" (p. 104). More broadly, Hine (2000) describes the internet as both a "culture" and a "cultural

artifact." She views "the Internet as a product of culture" produced by people and socially shaped by the larger context of society (p. 9).

This research aligns with these perspectives in that it investigates the culture emerging from social media use and views the digital traces within social media as cultural artifacts. The emerging social media culture as well as the social media artifacts themselves influence offline contexts and are influenced by the larger societal context. Therefore, online and offline behaviors are highly intertwined. Studying virtual phenomena in the crisis domain also illuminates the tightly coupled relationship between online and offline contexts. Most disasters tend to have an explicit geographic location tied to the crisis event. In this dissertation, I examine how online, virtual environments like social media services represent destinations for passing on crisis memories and subsequently narratives to help strengthen community resilience to future crises for specific geographic locations in the offline, physical world. Crises always have a connection to physical geographic places, and we are increasingly making this connection more visible with the design and use of participatory geotechnology and location-aware services.

Multi-sited ethnography and networked ethnography are similar approaches to investigating multiple online and offline sites. Marcus (1995) explains how multi-sited ethnographies are constructed by following the people, the story, the life, the conflict, or any other particular topic as a guide for choosing multiple sites that may be distributed in time and space. However, boyd (2008) argues that multi-sited studies "implicitly privilege one site over another" or may be constructed from a set of disconnected sites (p. 54). Instead, she promotes a "network-driven approach…[to] allow scholars to fluidly move along axes of people, places, and objects, generating meaningful networks and scapes [where] the sites are chosen in relation to

one another" (p. 54). Burrell (2009) also articulates how to strategically construct a "field site as a network" to more accurately examine cyberspace phenomena.

3.3.2 Web Sphere Framework

Although the multi-sited and networked ethnography approaches informed the initial construction of my field sites, Schneider and Foot's (2005) notion of a "web sphere" as a multi-dimensional unit of analysis for cybercultural studies more accurately represents the research design and methods employed in this dissertation. The value of the "web sphere" framework is that it is not simply a collection of disjointed websites, but rather "a set of dynamically defined digital resources spanning multiple web sites deemed relevant or related to a central event, concept or theme, and often connected by hyperlinks" (p. 158). The process of demarcating web spheres is often recursive and dynamically bounded over time, but the researcher can 'fix' the boundaries early in the study to generate "a clearly defined universe of sites" that would allow other researchers to replicate the study and/or collaborate during the analysis phase (p. 162).

Schneider and Foot (2005) present the "web sphere analysis" as a multi-method, integrative framework for "investigating communicative actions and relations between producers and users of web materials over time" (p. 159) and for "tracking developmental trajectories of online action" (p. 164). They also mention two approaches to studying online action that is similar to Have's (2004) two approaches to examining "natural documents." One approach is to conduct *discursive or rhetorical* analyses by focusing on the content of the website or document. Schneider and Foot (2005) argue that from an online action perspective, this approach "can help to illuminate social action" (p. 164). This approach was used to collect and analyze the crisis narratives that were social action-oriented. The other approach is to conduct *structural or feature* analyses by focusing on how the website or document is structured and by examining the

features within the site or document. This approach is a way of illuminating the "communicative, social and/or political action on the part of web producers" to better understand the co-production of the web artifacts and the online actions under investigation (p. 165). I used this approach to determine how the design of the features within each social media service facilitates curation. This research generated multiple web spheres and analyzed the data within each web sphere as well as across the web spheres.

For those conducting computer-mediated communication and internet-based research, it is increasingly necessary to apply both qualitative and quantitative methods to study the large datasets that result from the collection of digital data. Hine (2005) argues that "the Internet challenges us to break down the distinction between qualitative and quantitative methods" and that "the sheer amount of traces that online activities can leave, and that the researcher can amass, tend to lead even hardened (or softened) qualitative researchers towards more quantitative methods for summarizing data and exploring patterns" (p. 110). Thus, computational methods and data visualization techniques are often employed to help bridge quanitative and qualitative methods to better analyze and communicate findings from large datasets. Therefore, a mixed methods strategy was used to collect different types of data and triangulate the findings. A more detailed description of the research methods and the theoretical perspectives that guide this three-part research project appear in the next two chapters.

3.4 Summary

This chapter presented the research questions and provided an overview of the three parts that make up the research design. This chapter concluded with a discussion of the methodological approaches and issues when conducting online research. The next chapter details the research methods employed for *Part 1: Investigating Crisis Narratives*.

CHAPTER 4
INVESTIGATING CRISIS NARRATIVES

This chapter describes the two-phase study investigating the crisis narratives emerging in the social media landscape (Figure 4). Phase 1 consisted of a study surveying the social media presence for a selected 111 crisis events to understand the broader context of social media use in the crisis domain. Phase 2 consisted of in-depth investigations of four crises to determine the kinds of crisis narratives emerging in the social media landscape. Section 4.1 and 4.2 describes the methods employed in each phase. They also explain the data collection process and reflect on the methodological issues that arose from using virtual methods to investigate online behavior.

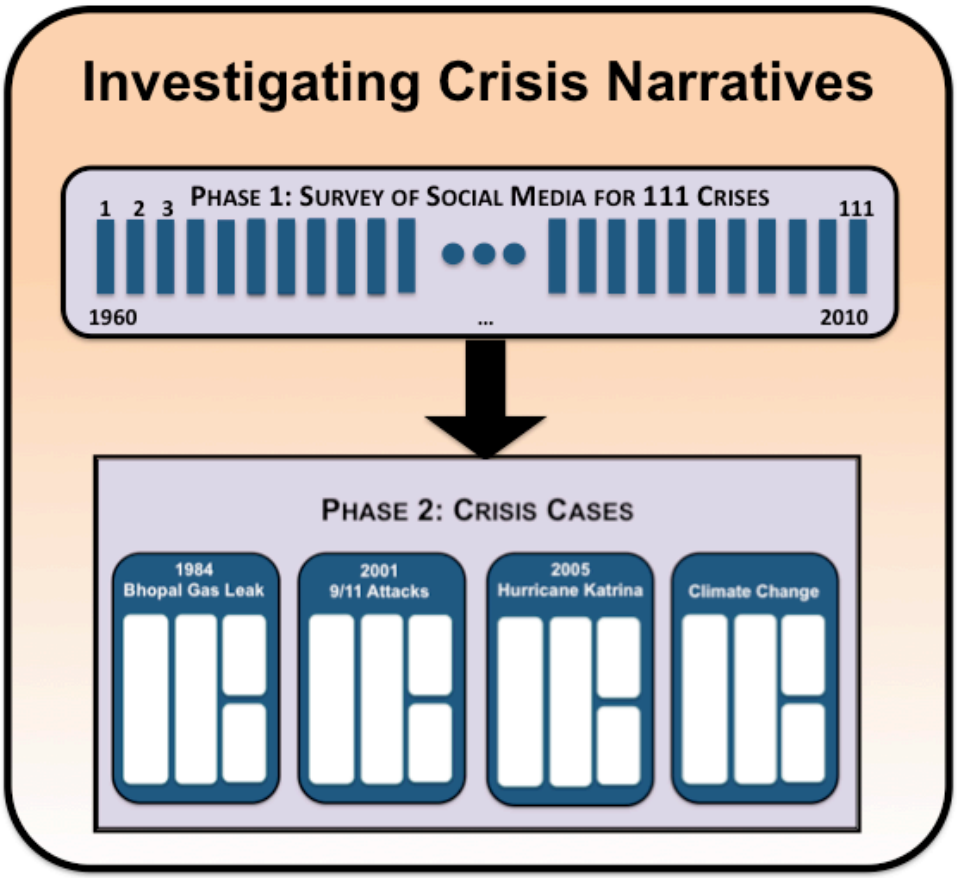

Figure 4: Overview of Part 1: Investigating Crisis Narratives Studies

4.1 Phase 1: Survey of Social Media Metrics for 111 Crisis Events

The use of social media in the immediate warning and response phase of a crisis is becoming more pervasive, but the role of social media outside of the emergency phase is still not well understood. What happens to the information space for historical crises a year later, a decade later, or even a generation later? Do these crises have an information space in the social media landscape? If so, how are they being commemorated through social media? To answer these questions, I conducted a study surveying a set of social media services to determine what kind of social media presence exists for major crises that occurred as far back as 1960, which is approximately the past two generations. Quantitative and qualitative social media metrics (e.g., number of Flickr photos or YouTube videos; most recent Wikipedia edit or blog post) were collected for each crisis to determine their social media presence. The goal of Phase 1 was to answer Part 1A Research Questions:

Part 1A Research Questions: Are people using social media to digitally commemorate crises? If so, what kinds of crisis commemoration trends are emerging?

The primary reason for conducting this survey was to understand the broader context of crisis remembrance activities taking place within social media. This survey also helped to determine whether crises that occurred before the social media age—beginning approximately around 1999 with the emergence of blogs—are being revived through social media. The findings from this survey enumerate which crises are being revived, how they are being revived, and what commemoration trends can be gleaned from social media activity for recent crises that occurred during the social media age.

To design a study that surveys the social media presence of historically significant crises, social media metrics were collected for each crisis. First, I chose 111 crisis events that took place over the past 50 years. Then, I chose a set of social media metrics from multiple social media

services that would indicate a noticeable social media presence. The survey study was developed and implemented over a three-month period between June and August 2010. The next two subsections explain how the crises and social media metrics were chosen respectively.

4.1.1 Historically Significant Crises

The first part of the survey consisted of choosing crisis events that took place between 1960 and 2010, which is over a span of approximately two generations. The purpose of choosing crises within this time period was to select a span of time long enough to find historical trends but also narrow enough to make the collection process manageable. The minimum requirement for a crisis event to be included in this survey was that it had to have an English language Wikipedia article associated with that crisis event. Wikipedia is increasingly being used to document historical events. A Google search of a crisis event tends to show its Wikipedia article as the first search result. Thus, having a Wikipedia article is an important indicator of a crisis event's presence online in the social media world.

Of the thousands of major crises and disasters that have occurred since 1960, the "worst" natural, technological, and social hazards were selected. I selected the deadliest and strongest earthquakes, the deadliest and costliest hurricanes (also known as tropical storms, typhoons, and cyclones), and other natural hazards (e.g., wildfires, blizzards, volcanoes, etc.) that made a noticeable impact on society. For technological hazards, I selected industrial disasters that led to a high number of deaths and long-term effects. For social hazards[16], I selected notable terrorist attacks, political demonstrations that killed at least 1,000 people, massacres that had more than

[16] Although a social hazard is a broad type of hazard agent that can include phenomena like smoking in public places, this research focuses on social hazards that are humanitarian crises that are crimes against humanity for sociopolitical purposes. I use Oliver-Smith's (2002) interpretation of Hewitt's (1997) view of disaster agents, where he defines social hazards as war, terrorism, civil conflict, and the use of hazardous materials to deliberately cause harm to others. I chose not to include wars because they contain a different set of attributes that make them less comparable to the other crises.

500 deaths, and school shootings that had over 10 deaths. I also included food crises and famines[17] that resulted in thousands of deaths and/or people suffering from malnutrition.

Online lists of historical crises guided the selection process of the "worst" disasters. First, the following Wikipedia articles were examined: List of natural disasters by death toll,[18] accidents and disasters by death toll,[19] notable tropical cyclones,[20] earthquakes,[21] historic fires,[22] famines,[23] wars and disasters by death toll,[24] battles and other violent events by death toll,[25] massacres,[26] and school shootings.[27] The benefit of initially using these Wikipedia articles is in part because they efficiently aggregate these disaster lists, rank these crises chronologically and based on severity, and cite a variety of references as sources for generating these lists. These Wikipedia articles also were collaboratively developed and monitored by a number of people with an average of 2,148 Wikipedia edits ranging from 231 to 4,267 and an average of 824 Wikipedia editors ranging from 439 to 1,582.

Other publicly available disaster lists and scientific resources were used to validate, adjust, and ultimately triangulate the list of crises that were chosen for this survey study. Eight online articles and web pages contained a list of the worst and deadliest disasters around the world, providing justification of what some from the wider public believe were the "worst" disasters. The list of crises constructed for this was also compared with those that appear in Eshghi and Larson's (2008) article entitled "Disasters: Lessons from the Past 105 Years" and in

[17] Though the cause of famines may sometimes be due to natural hazards (e.g., droughts and floods), the effects of famines are often exacerbated by social hazards (i.e., poor governance and civil war). To simplify, I categorized the famines chosen for this study as social hazards, since most of them resulted from poor governance.
[18] http://en.wikipedia.org/wiki/List_of_natural_disasters_by_death_toll
[19] http://en.wikipedia.org/wiki/List_of_accidents_and_disasters_by_death_toll
[20] http://en.wikipedia.org/wiki/List_of_notable_tropical_cyclones
[21] http://en.wikipedia.org/wiki/List_of_earthquakes
[22] http://en.wikipedia.org/wiki/List_of_historic_fires
[23] http://en.wikipedia.org/wiki/List_of_famines
[24] http://en.wikipedia.org/wiki/List_of_wars_and_disasters_by_death_toll
[25] http://en.wikipedia.org/wiki/List_of_battles_and_other_violent_events_by_death_toll
[26] http://en.wikipedia.org/wiki/List_of_massacres
[27] http://en.wikipedia.org/wiki/School_shooting

Spignesi's (2002) book entitled *The 100 Greatest Disasters of All Time*. Lastly, a timemap mashup[28] was created using the SIMILE Exhibit[29] widget, which integrates a Google Map, a Google Docs Spreadsheet, and a SIMILE Timeline[30] widget into a single webpage. Figure 5 shows a screenshot of the timemap mashup. The date and location of all the crisis events were imported into a Google Docs Spreadsheet and then plotted onto this interactive map and timeline. This mashup was used during the crisis selection process to visually check each crisis event's spatial and temporal coverage in order to produce a representative selection of crises for this study.

Triangulating my disaster list using multiple resources resulted in a sample of 111 historically significant crises that occurred over the past 50 years. Although many notable crises are included in this survey, it may not include all of the most significant ones.

Table 1 enumerates what type of crises were selected based on three characteristics: (1) type of hazard (i.e., natural, technological, and social hazards), (2) type of crisis (e.g., earthquake, hurricane, massacre, oil spill, etc.), and (3) when these crises took place according to the technological ages mentioned in Section 3.1.2 (i.e., pre-web age, web age, and social media age, as mentioned in Section 3.1.2). These crisis events were coded "pre-web age" if they took place between 1960 and 1992, "web age" if they took place been 1993 and 1998, and "social media age" if they took place between 1999 and 2010. Chapter 6 discusses crisis commemoration trends that occurred in the "pre-social media age," which are crisis events that took place between 1960 and 1998. The three pie charts in Figure 6 provide a visual breakdown of the 111 crisis events that were selected for this study. Each crisis event is color-coded based

[28] http://sophiabliu.com/crisissurvey.html
[29] http://www.simile-widgets.org/exhibit/
[30] http://www.simile-widgets.org/timeline/

on the type of hazard; natural hazards are green, social hazards are red, technological hazards are blue, and the miscellaneous events of climate change and global warming are yellow.

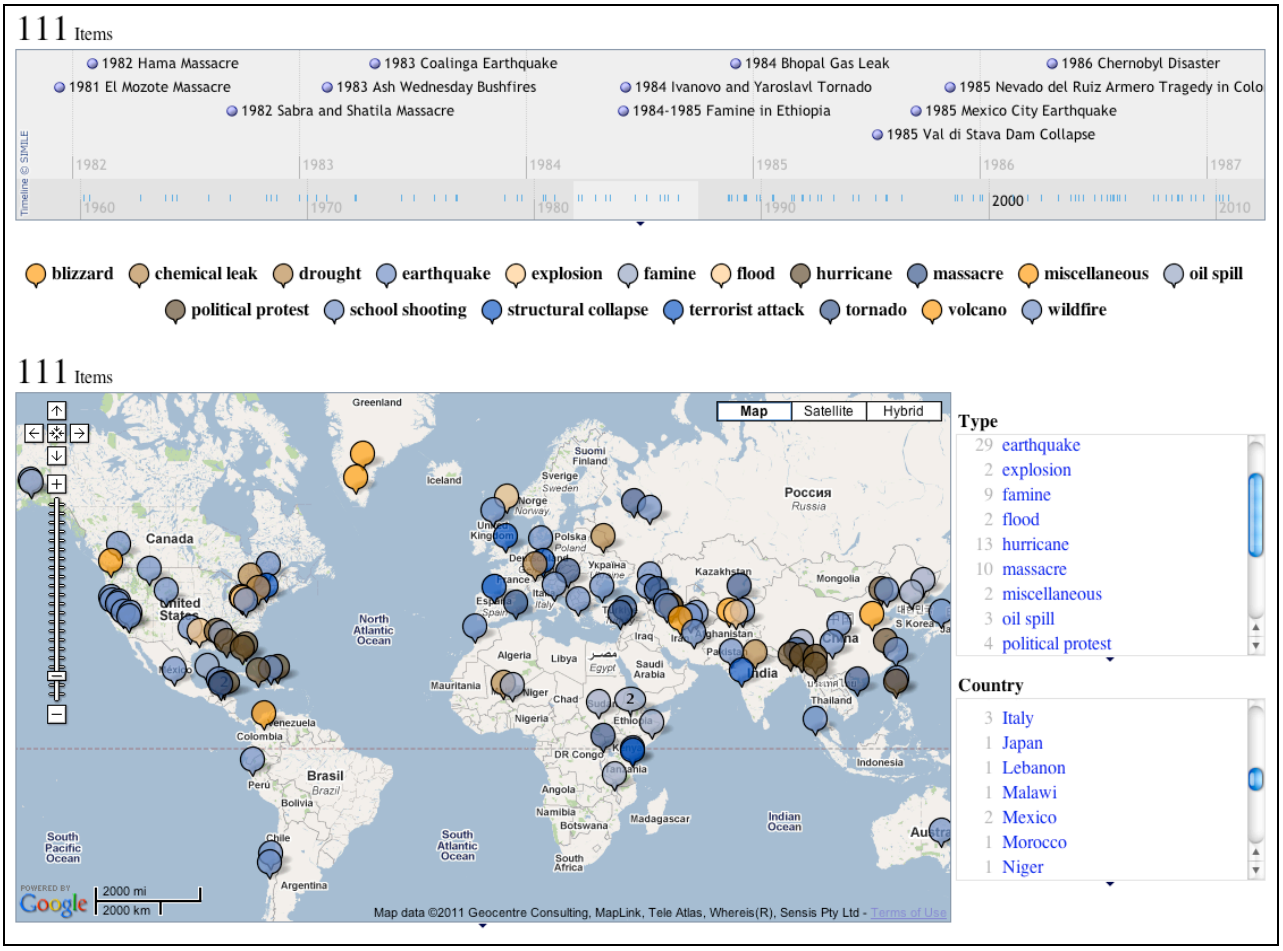

Figure 5: Spatiotemporal Mashup of 111 Crisis Events

Type of Hazard	Type of Crisis	Number of Events [N1: Pre-Web Age N2: Web Age N3: Social Media Age] N1	N2	N3	Total	
Natural Hazards	Earthquakes	18	2	9	29	**62 of 111 (55.8%)** 36 of 61 (59%) Pre-Web Age 4 of 10 (40%) Web Age 22 of 38 (58%) Social Media
	Hurricanes	9	1	3	13	
	Wildfires	3	0	7	10	
	Blizzards	1	1	2	4	
	Floods	1	0	0	1	
	Tornadoes	2	0	0	2	
	Volcanoes	2	0	0	2	
	Drought	1	0	0	1	
Social Hazards	Famines	3	2	4	9	**35 of 111 (31.5%)** 15 of 61 (24.5%) Pre-Web Age 6 of 10 (60%) Web Age 14 of 38 (36.8%) Social Media
	Massacres	6	2	0	8	
	School Shootings	2	1	4	7	
	Political Protests	4	0	2	6	
	Terrorist Attacks	0	1	4	5	
Technological Hazards	Chemical Leaks	5	0	0	5	**12 of 111 (10.8%)** 10 of 61 (16.3%) Pre-Web Age 0 of 10 (0%) Web Age 2 of 38 (5.2%) Social Media
	Oil Spills	2	0	1	3	
	Explosions	1	0	1	2	
	Structural Failure	2	0	0	2	
Miscellaneous	Climate Change	*Emergency Period Disputed*			1	**2 of 111 (1.8%)**
	Global Warming				1	
SUMMARY		61	10	38	111 Crisis Events in Total	

Hazard Type: 62 Natural Hazards; 35 Social Hazards; 12 Technological Hazards; 2 Misc.
Age Type: 61 Pre-Web Age Crises; 10 Web Age Crises; 38 Social Media Age Crises
[71 Pre-Social Media Age Crises]

Table 1: Type of Crisis Events Selected for Survey

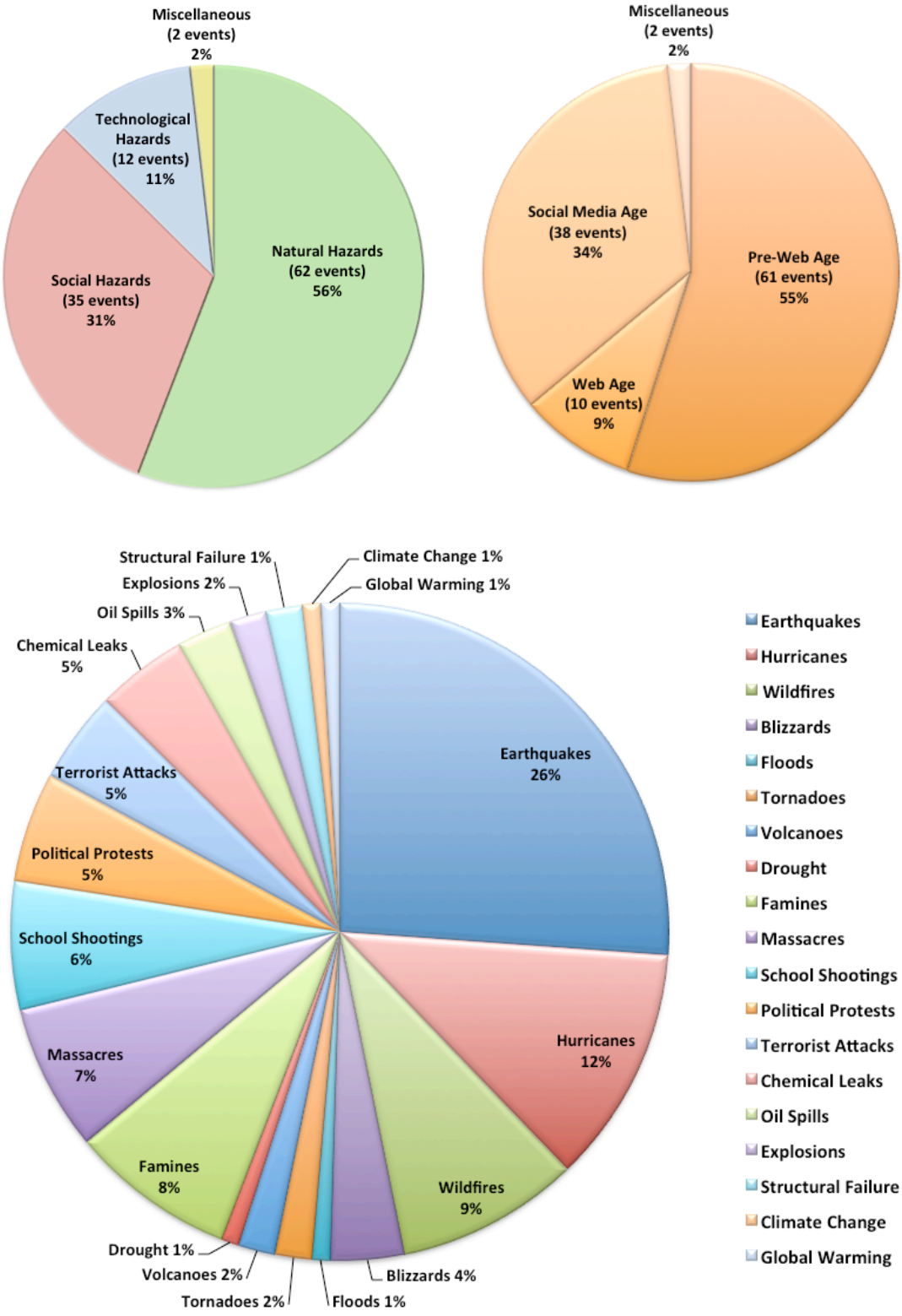

Figure 6: Pie Charts of the 111 Crisis Events in Survey

4.1.2 Social Media Metrics

The second part of the survey consisted of selecting social media metrics that would provide an indication of social media presence. Empirical findings from my previous exploratory research and investigations were used to inform which social media sites and metrics to collect (Palen et al., 2009; Liu et al., 2008; Liu and Palen, 2010; Hughes et al., 2008). The following seven social media sites were selected: English Wikipedia,[31] Facebook,[32] Flickr,[33] YouTube,[34] Delicious,[35] Digg,[36] Twitter,[37] as well as blog posts, web mashups, and digital archives.

In addition to collecting background information on each crisis event, a total of 50 social media metrics were collected for each event. Table 2 provides a breakdown of the 50 social media metrics containing quantitative metrics (e.g., number of YouTube videos, Facebook groups, blog posts, etc.) and qualitative metrics (e.g., the first contributor of the Wikipedia article, the most recent Flickr photo, the most recent blog post, etc.). However, the metrics with asterisks in Table 2 (i.e., the number of views of a Wikipedia article, the Twitter metrics, first blog post link and date, number of spatiotemporal mashups, and number of user-generated/museum-generated archives) proved to be difficult metrics to accurately collect; therefore, only some crisis events contain data for these metrics. Approximately 5,000 social media metrics were collected in total. The internal algorithmic search features within Facebook, Flickr, YouTube, Delicious, Digg, Archive-It, and the Library of Congress were used to collect the associated metrics indicated in Table 2. Third party tools were used to collect the other metrics.

[31] http://en.wikipedia.org
[32] http://www.facebook.com
[33] http://www.flickr.com
[34] http://www.youtube.com
[35] http://www.delicious.com
[36] http://digg.com
[37] http://twitter.com

Multiple third-party Wikipedia tools were used. The WikiChecker[38] tool provided data regarding the date of the first and most recent edit, the number of edits, the number of days maintained, the number of days per edit, the number of editors, and the most frequent editor for a specific Wikipedia article. Each English Wikipedia article's "View History" page displayed the first editor of the article. The third-party tool called Watcher[39] was also used to determine the number of watchers for that article, which are Wikipedia users that receive automatic updates of changes to Wikipedia articles that they include in their "watchlist." Lastly, the Wikipedia article traffic statistics[40] tool was used to find the number of times a Wikipedia article was viewed for a particular month. The total number of views since the life of the article was not available; however, articles that received a large amount of traffic are sorted from highest to lowest and given a ranking number. Therefore, the number of views for the month that it was collected was documented, and articles that had a ranking number was also recorded.

In the case of Twitter, it was not possible to search the entire database of tweets in the same way as the other social media services, thus making the Twitter metrics less comparable to the other social media metrics. Some crisis-related tweets were available in the Twitter Search[41] results, but the Twitter Search API[42] only provides a sample of the most recent tweets containing the search term provided. I recorded the number of tweets with keywords associated with each crisis event, any hashtags that developed, any trends in when the tweets were generated, and a link to the most recent tweet. TweetMeme[43] was also used to determine the number of links related to the crisis event that were sent through Twitter, and TLists[44] was used to determine the

[38] http://en.wikichecker.com
[39] http://toolserver.org/~mzmcbride/watcher
[40] http://stats.grok.se
[41] http://search.twitter.com
[42] http://search.twitter.com/api
[43] http://tweetmeme.com
[44] http://www.tlists.com

number of Twitter Lists relevant to the crisis event. In comparison to the other social media metrics, the Twitter metrics were not as accurate or complete allowing only a modest speculation of trends that could be drawn from the Twitter metrics.

To collect the blog metrics, Google Blog Search[45] was used to find the number of blog posts and the most recent blog post for each crisis event. The search results were sorted by date but only the most recent posts were viewable. As with many of Google's search results, the number of results shown does not equate to the actual search results that Google allows a user to look at in their result pages. In other words, Google limits the number of results and pages a user can look at making it difficult to find the first blog post in their search results. The other difficulty with finding the first blog post is that many blog search engines index blogs based on their site feeds, but links to specific blog posts are not always cached in the same way.

I also attempted to search for and collect the number of web-based map mashups related to each crisis event. Mashups are web applications that use openly published Application Programming Interfaces (APIs) to access, extract, and recombine data feeds from multiple sources into a single integrated application. In my previous work, I conducted an empirical study investigating the creation of crisis map mashups through the use of participatory geotechnology, a type of social media that facilitates the creation of user-generated maps (Liu and Palen, 2010). I decided to collect links to sites that exhibited a spatial (i.e., map-based) and/or temporal (i.e., timeline-based) mashup of content related to each crisis event. The Google Maps[46] search engine was used to search for user-generated maps. Timelines.com[47] was used to search for timeline mashups. A general Google Search was also conducted to find publicly available spatiotemporal mashups on the web.

[45] http://blogsearch.google.com
[46] http://maps.google.com
[47] http://timelines.com

Last, I attempted to document the number of crisis-related digital archives publicly available online as well as the number of digital artifacts that existed within specific digital archive services. A general Google search was conducted to find user-generated archives, museum-based archives, and other online exhibitions related to each crisis event, but it was difficult to conduct a comprehensive search for them online. Therefore, metrics from the Internet Archive[48] digital library and the Archive-It[49] service was used more so to obtain the number of "born digital" artifacts preserved for each crisis event. The Library of Congress[50] search engine was also used to collect the number of items in their collection related to each crisis. The search results included Library of Congress web pages, their U.S. historical cultural collections, items from the Library of Congress online catalog as well as their prints and photographs online catalog, and documents related to legislation and congressional activity. The purpose of collecting this data from the Library of Congress was to provide a point of comparison between the number of born-digital artifacts and the number of artifacts archived from a traditional cultural heritage institution.

[48] http://www.archive.org
[49] http://www.archive-it.org
[50] http://www.loc.gov/library/libarch-digital.html

Social Media Service	Social Media Metrics	Social Media Service	Social Media Metrics
Background Info About Crisis Event	Date of Crisis	**Flickr** (5 metrics)	# of Images
	Type of Crisis		# of Groups
	Location		Link to Recent Discussion
	Impact		Link to Recent Photo
	# of Deaths		Date of Recent Photo
	# of Injured	**YouTube** (6 metrics)	# of Videos
Wikipedia (11 metrics)	Date of First Edit		# of Playlists
	Date of Recent Edit		Link to Recent Video
	# of Edits		Date of Recent Video
	# of Days Maintained		Link to Video w/ Highest Views
	# of Edits per Day		# of Views for Top Video
	# of Editors	**Blogs** (5 metrics)	# of Blog Posts
	First Editor		Link to Recent Blog Post
	User with Most Edits		Date of Recent Blog Post
	# of Views *		Link to First Blog Post *
	# of Watchers		Date of First Blog Post *
	# of References	**Delicious** (3 metrics)	# of Bookmarks
Twitter (6 metrics)	Hashtag *		Date Trends
	Date Trends *		Type of Bookmarks
	# of Tweets *	**Digg** (3 metrics)	# of Digg Results
	Recent Tweet *		Highest # of Diggs
	# of Links *		Highest # of Comments
	# of Twitter Lists *	**Mashups** (1 metric)	# of Spatiotemporal Mashups
Face book (6 metrics)	# of Groups	**Digital Archives** (4 metrics)	User-generated Archives and Museum-generated Archives *
	# of Causes		# of Internet Archive Results
	# of Fan Pages		# of Archive-It Results
	Link to Recent Post		# of Library of Congress Results
	Date of Recent Post		

Table 2: The 50 Social Media Metrics Selected for Survey

***Asterisks indicate the metrics that may not be accurate due to difficulties in collecting this type of data**

4.1.3 Analysis of Survey Data

As mentioned previously in Section 3.4.2, Schneider and Foot's (2005) *web sphere analysis* framework guided the development and analysis of this survey. According to Schneider and Foot (2005), web spheres can act as "macro, aggregate units of analysis, by which historical and/or inter-sphere comparisons can be made" (p. 159). Two types of web spheres were generated for this study. Each of the 111 crisis events containing social media metrics is considered a fixed web sphere, since a clearly defined set of metrics were collected for each crisis event (see the blue rectangle in Figure 7A). The other type of web sphere is the entire collection of 111 web spheres generated for each crisis event (see the contents within the round purple/periwinkle rectangle in Figure 7B). This was a dynamically bounded web sphere because crisis events that occurred over the past 50 years were gradually included to gain more coverage.

To generate both of these types of web spheres, a "search-oriented strategy" was employed using key words and phrases associated with each crisis event to systematically examine the social media ecosystem and obtain the social media metrics (Schneider and Foot, 2005, p. 163). As a result, each type of web sphere contains a snapshot of the quantitative and qualitative social media presence specific to each crisis event at the time of the data collection. This means that another researcher will not be able to replicate the results of this survey, since the social media metrics dynamically change over time. However, the process of obtaining these metrics could be replicated and potentially automated to more easily collect large amounts of metric data over a longer time period.

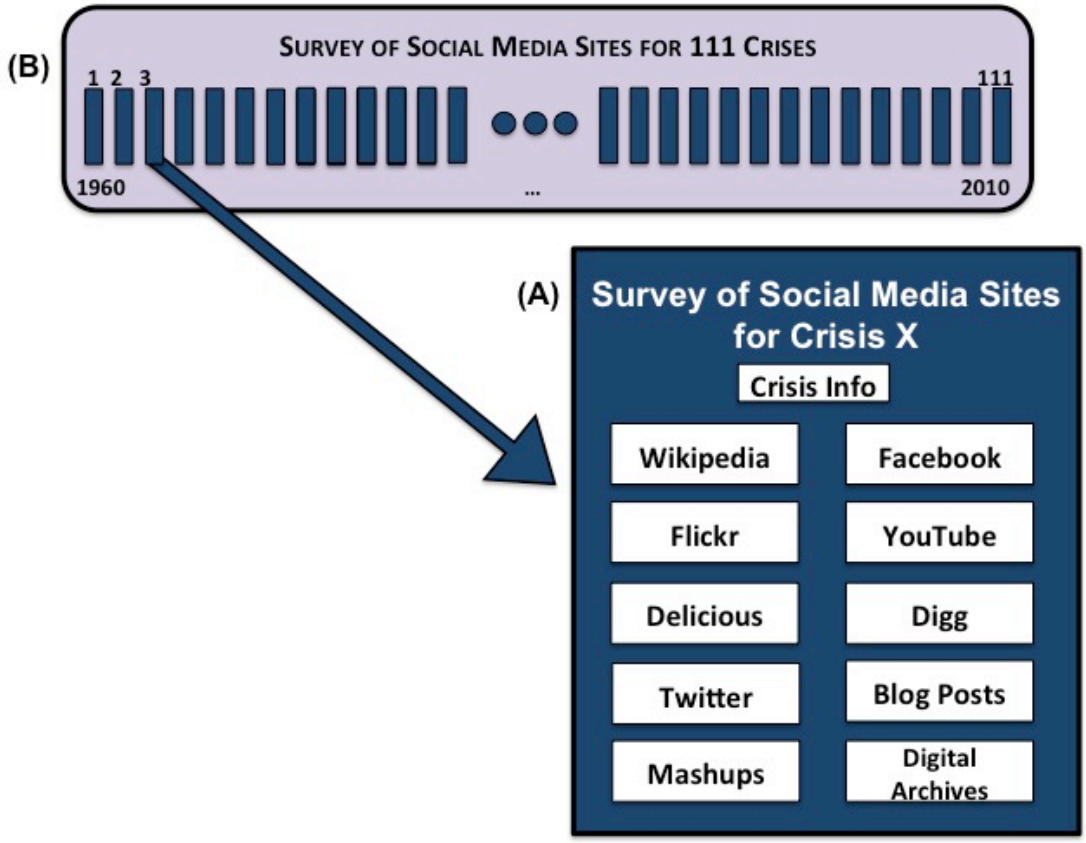

Figure 7: Two Types of Web Spheres
(A) 111 Crisis Web Spheres and (B) the Entire Collection of 111 Crises as a Web Sphere

Each of the 111 fixed web spheres were "bounded" by pre-identified constituent elements (i.e., eight social media services and a set of 50 quantitative and qualitative social media metrics), a specified collection period (i.e., between June 2010 and August 2010), and a pre-determined protocol for collecting the social media metrics across all the social media services. This "fixed bounding" process of generating the web spheres for each crisis event allows comparative analyses to be conducted across all crisis events.

The social media metrics were manually collected but the search algorithms embedded in each of the social media services and in Google Search also aided the collection of these metrics.

Thus, the accuracy of the social media metric data collected for this survey largely depended on the search terms that were selected and the search algorithms developed within each social media service. English search terms were primarily used to obtain the social media metrics; therefore, the results of this survey is skewed towards English language social media metrics. Also, it was difficult to manually check each result to determine its relevancy, thus spam and other irrelevant results may be included in the quantitative metric data.

Chapter 6 explains the process of analyzing the social media metrics for the 111 crisis events and the findings from this analysis. It describes which crisis events had a high social media presence across multiple social media services. It also explains the type of crises that exhibited a presence in Wikipedia, Facebook, Flickr, YouTube, the blogosphere, Twitter, and open digital archives.

Findings from Phase 1 provided a broad overview of the online commemoration trends in the crisis domain and early indicators of the types of meta-narratives appearing in the social media landscape. Conducting the survey of social media presence for 111 crisis events was necessary to select and confirm which crisis events to investigate in more depth. Phase 2 focuses on the investigation of three crisis events to determine the types of narratives being generated through social media services.

4.2 Phase 2: In-Depth Investigations of Four Crisis Cases

This section describes the research methods used to conduct Phase 2 of the Crisis Narratives study. The purpose of Phase 2 is to answer Part 1B Research Questions:

Part 1B Research Questions: Why are people using social media to share crisis memories?
What narratives are emerging in the social media landscape?

In-depth studies for three specific crisis events were conducted to determine what crisis narratives existed in the social media landscape. Section 4.2.1 explains the three crises I selected. Section 4.2.2 explains how I conducted ethnographic investigations online and describes the issues that arose from employing participant observations within social media services. This section also explains the type of participants I selected and the issues that arose when conducting virtual interviews. Section 4.2.3 explains the automated collection methods used to collect other types of social media data for each crisis. Lastly, Section 4.2.4 explains the process of analyzing the crisis cases.

4.2.1 Selecting the Crisis Cases

Findings from the study in Phase 1 provided the context I needed to determine which crisis events were worthy of a deeper investigation. Each crisis had to show a high social media presence in Phase 1, be caused by different hazard agents, and occur at relatively different time periods. The following four crises were selected: 1983 Bhopal gas leak, 2001 September 11 attacks, 2005 Hurricane Katrina, and the climate change crisis.

The 1984 Bhopal gas leak was selected because it was a technological hazard that occurred before the invention of the web. Although the 1986 Chernobyl disaster could have been chosen since it was a pre-web crisis event that had the highest social media presence, the Bhopal gas leak also showed a significant social media presence worthy of further investigation. This gas leak was also the deadliest technological disaster in history that resulted in long-term effects and the exposure of a related disaster, water contamination. Though this crisis took place in Bhopal, India, there are strong connections to the U.S. due to legal ownership and corporate responsibility issues. Such issues have led to a rise in social action that are relevant to my research questions.

The 2001 September 11 attacks were selected because it was a social hazard or human-induced event that occurred during the web age and the time of weblogs but before the popularity of recent social media services like Wikipedia, Facebook, and Flickr. The 1994 Rwandan genocide could have been chosen, since it was a social hazard event that occurred before the social media age that exhibited a high social media presence. However, the September 11 attacks still continue to be an important historical disaster in the U.S. with terrorism becoming a type of human-induced hazard that dominates disaster management issues.

The 2005 Hurricane Katrina was selected because it was caused by a natural hazard that occurred when social media services like blogs, MySpace, Facebook, and Flickr were just starting to become more widely used. It was also a natural hazard event that had the highest social media presence of all the 111 crisis events I surveyed. The 2010 Haiti and Chile earthquakes also showed a high presence but they were not selected since these crises were too recent and crisis remembrance activities were not yet fully developed. Hurricane Katrina was also a significant U.S. disaster and one of the worst natural hazards to hit the U.S. more recently.

The climate change crisis and global warming as a related phenomenon were selected because they exhibited a very high social media presence. Unlike the previous crises, climate change is a different type of hazard that does not have a clear emergency period. It is also a type of crisis that produces natural hazards but is considered an anthropogenic phenomenon. What makes this crisis worthy of studying is how climate change has become a higher-level crisis that is beginning to link its effects to existing historic crises like Hurricane Katrina.

The reason for choosing crises caused by different hazard agents was to find common and distinct themes in the crisis narratives across all three types of hazards. The reason for choosing crises that occurred at relatively different timeframes according to innovations in networked

technology was to yield insights about how historical events are being "revived" through social media as well as how recent crises are captured in real-time using today's available ICT.

4.2.2 Qualitative "Virtual Methods"

For each crisis, an in-depth qualitative research study was conducted using "virtual methods," which are "methodological solutions to understanding social interactions mediated by ICTs" (Hine, 2005, p. 1). This section describes how I conducted online participant observations and documentary research, the types of participants that I selected, and the issues that arose in conducting virtual interviews.

4.2.2.1 Online Participant Observation and Online Documents

Observational approaches were used to understand the social behaviors occurring within each of the social media services. Online participant observation produced a different set of opportunities and challenges in comparison to traditional forms of participant observation in physical spaces. To fully engage in the participant role, I joined Facebook, Flickr, and YouTube in February 2006 and Twitter in May 2007. I also began blogging on Blogger in January 2006. Participating and observing each of these five social media services during the exploratory research phase allowed me to become more familiar with the behaviors and norms that have emerged in these online sites, especially during recent crises. I chose not to be anonymous by using my personal accounts showing my full name to make my online identity as a bona fide researcher publicly visible to potential participants. I also joined crisis-specific social media groups and email listservs to receive regular updates about their activities. In one instance, a participant made me an officer of his Facebook group. I also actively participated by posting content within each of these social media services and engaged in other common social media

activities like tagging and creating groups. However, I minimized my participation in certain crisis-related social media services so as not to influence my field sites.

Conducting participant observation of online sites within social media services is different from conducting participant observations at physical research sites. There is a low barrier to entry when observing social media use because these services are publicly accessible and sometimes only required new users to setup a free account to fully participate. Also, anyone can "unobtrusively" observe publicly available content. However, "unobtrusive" observation could also be "invasive," as shown in my previous experience conducting computer screen recording (Tang et al., 2006). I was attentive not to contact people who were too closely affected by the crisis and would be uncomfortable participating in my research study. Since the crisis events I focused on occurred some time ago, this was less of a problem.

Conducting online research can be closely linked to documentary research. The web provides "unprecedented access to documents" that has revolutionized the documentary research process (McCulloch, 2004, p. 34). The web changes how we think about documents when they are digitized and become accessible through the web. The web is also a medium that documents people's online behaviors by leaving digital traces within these websites. These publicly available online traces are "natural documents," which are documents "produced as part of current societal processes, that is *not* for the purpose of the research project in which they were used" (Have, 2004, p. 88). Much of my online observations consisted of analyzing digital traces and artifacts (i.e., Facebook and Twitter posts, Flickr photos, YouTube videos, Wikipedia articles, blog posts, etc.) as documents. Although the web content can be ephemeral, the web also has "a sense of persistence and even permanence" that makes web content searchable because they are indexed in databases and are shared to a network of users that can then be saved locally

(Schneider and Foot, 2005, p. 167). The *factist*, *discursive/rhetorical* approach was employed to understand the content of these documents and the *specimen*, *structural/features* approach was employed to understand the form and structure of these documents (Have, 2004; Schneider and Foot, 2005). For example, I analyzed the content of a Wikipedia article but also the features within Wikipedia that facilitated distributed authorship and the co-production of the article's content. After observing the content within these sites, I chose specific participants to interview.

4.2.2.2 Study Participants

A diverse set of participants was selected to obtain multiple perspectives on this research topic. The participants were selected according to specific criteria. I interviewed a total of 90 participants. Figure 8 depicts the geographic locations of all 90 participants. Table 3 provides a breakdown of the different types of participants, some of whom appear in multiple categories. I interviewed 16 participants for each of the three crises. These participants were survivors, volunteers, or experts on each crisis. I also interviewed 18 participants who exhibited relevant social media activity for other recent disasters (i.e., the 2010 Haiti and Chile earthquakes) and/or who are disaster experts (i.e., disaster sociologist, emergency blogger, and crisis technology expert). I interviewed 52 social media users and 25 social media experts, namely researchers who study social media or developers who build social media applications. Table 3 also includes the type of participants I interviewed for the *Critiquing Curation* study, namely 15 participants that are curators, used the word curation in the social web context, or are technology developers building web services that support curation. In total, I interviewed 58 males and 32 females.

Figure 8: Locations of All 90 Participants

Types of Participant		# of Participants
Crisis Expertise	1984 Bhopal Gas Leak	16
	2001 September 11 Attacks	16
	2005 Hurricane Katrina	16
	Climate Change	9
	Other Crises and Disasters Experts	18
Social Media Expertise	Social Media Users	52
	Social Media Experts	25
Curation Expertise	Curation Experts	15
Gender	Male	58
	Female	32

Table 3: Breakdown of the Different Types of Participants

Within each social media service, participants who exhibited relevant activity (i.e., digital traces of crisis remembrance and social action activities) on Facebook, Flickr, YouTube, Twitter, Wikipedia, and blogs were recruited. Within each of the social media services, social media metrics (i.e., top contributors, recent and most viewed photo/video, etc.) were used to narrow down my list of potential participants and then contacted those that provided contact information.

For Facebook, group administrators for the top three Facebook groups that had the highest number of members for each crisis, people that created a high volume of digital traces within Facebook groups, and the top recruiters for Facebook causes were contacted. For Flickr, group administrators for the top Flickr group that had the highest number of photos for each crisis, the top three contributors of that group, and Flickr users that uploaded pertinent photos were contacted. For YouTube, the creators of the top five "most viewed" YouTube videos for each crisis were contacted. For Twitter, Twitter users that created tweets relevant to the crisis narratives I found for each crisis event were contacted. For Wikipedia, top contributors of the Wikipedia articles associated with each crisis were contacted. For blogs, Google Blog Search was used and bloggers that wrote blog posts related to remembrance and social action specific to each crisis were contacted.

4.2.2.3 Interviewing

The length of the interviews varied with each participant. Some were short-term (e.g., one-time interactions), while others were long-term (e.g., the longest being 15 months). Both synchronous and asynchronous communication media were used to interview each participant. I conducted 17 by email; 18 by phone; 15 using private messaging services within Facebook, Flickr, YouTube, and Twitter; 10 face-to-face; 3 using Skype's videoconferencing feature; one using an instant messaging/chat service; and 26 using a combination of these modes. Participants were asked to sign a Participant Informed Consent Form or confirm that they agree to participate in my research study if obtaining a physical signature was inconvenient using a waiver of written consent (Appendix B). The form also asked participants to specify what type of recording (i.e., audio, photo, or video recording) they would allow during the interview; however, this excludes email interviews since participants write their responses and are thus recorded textually. The

form also asks if they would allow their data to be published in research publications or publicly shared online, and if they would like their names disclosed. I expected that many would *not* want to be anonymous as a function of maintaining their public personas; however, I chose not to use names for those who could not be contacted or those who wanted to stay anonymous.

Although some interviews were semi-structured, most of them tended to be un-structured and open-ended facilitating a more in-depth, conversational interview style. A set of open-ended interview questions were used for each interview that was intended to gather retrospective accounts as well as prospective thoughts to encourage participants to take a more future-oriented perspective. The following is a list of some of the open-ended interview questions used to start the interview:

- What memories are being shared about this crisis today within these social media sites?
- What memories do you think are worth sharing and preserving?
- How are you sharing these memories through social media?
- Why did you share these memories through social media?
- What do you want people 50 or 100 years from now to remember about this crisis?
- What values do you see emerging from using social media in the crisis context?
- What aspects of social media would you preserve for future generations?

Each of these questions and supplementary questions were tailored to each participant by referencing their digital traces and asking about their expertise in this area. Although I initially led the interview with these questions, the participants ultimately structured the form and content of the interview evoked by my broad enquiry (Mann and Stewart, 2000). As a result, the interview data became a set of stories about their own experiences and the experiences of others that they believe were relevant to my research questions.

Sustaining the research relationship was an important part of the interview process and managing this relationship through virtual means created a different set of issues to consider.

Even though the web and the social media services have porous boundaries that allow anyone to participate, it was also important to have a visible online presence as a researcher studying social media to legitimate my entrée into this research field. Creating a comfortable and friendly research environment in the virtual context had to be done predominantly through text. Rapport was established with each participant by alternating between a formal and informal style of questioning and conversing to adapt to each participant's communication style (Kivits, 2005). One way in which I established trust with my participants was by caring about and showing a genuine interest in their lives more broadly (Orgad, 2005). A fine balance is needed between being authentic and sincere and exhibiting professionalism.

Many challenges also arose in maintaining the researcher-participant relationship online. Maintaining the participant's interest in answering interview questions depended on how busy their schedule was, how the questions were phrased in written form, and what value they saw in participating in my research study. Some participants were reluctant to participate over a long period of time by only wanting a one-time interview due to their time constraints. Others were willing to have a long-term research relationship by meeting face-to-face, having phone conversations, and/or emailing multiple times throughout the research study.

Asynchronous media (i.e., email and social media messaging services) have their own set of challenges. Since many people are increasingly overloaded with email in their inbox daily, some preferred to answer questions over the phone rather than through email, since it was quicker and easier than having to remember and find time to write a detailed response to the questions via email. Also, gestures like nodding or maintaining eye contact were not visible; therefore, they needed to be translated through text by writing a response that acknowledged the participant's viewpoint or using emoticons to clarify the intended tone or sentiment (Markham,

2004). Some challenges arose when using social media messaging services. Sometimes they were the only way to contact potential participants but they were not as regularly monitored. Lastly, I myself found it was difficult to maintain a long-term research relationship with all of my participants. Some participants wanted to have long phone conversations while others wanted to facilitate long-term email conversations. I quickly became overloaded by my concurrent research activities making it difficult to keep up with all these online research relationships. Nevertheless, I maintained some of these relationships and recognized some of the advantages to using asynchronous media.

Conducting remote interviews via asynchronous media led to a different set of opportunities and challenges. For example, virtual methods allowed me to reach geographically dispersed participants making the interviews logistically and financially more feasible. Communicating asynchronously enabled participants greater flexibility in terms of the frequency and length of their responses (Kivits, 2005; Mann and Stewart, 2000). Also, email and other message-based interviews took a longer amount of time in part because these text-based interviews incorporate the transcription process, which is often more time consuming and costly than voice-based interviews. Asynchronous communication also cultivated a more "reflective process" by allowing both the researcher and the participant to take the time needed to think of and answer questions as well as elaborate on previous answers (Kivits, 2005; Hine, 2005). Additionally, many of my participants used email to send me links to online materials relevant to the interview and my research study (Kivits, 2005). Conducting synchronous but remote interviews via phone or instant messaging allowed me to take notes without having to be attentive to physical gestures and behaviors like maintaining eye contact, and it enabled me to transcribe the interview while the participant was talking.

Some differences in the quality of the interviews were apparent based on the type of communication medium used. For example, email interviews tended to facilitate longer responses than the messages sent through the private messaging services within the social media services. Those who preferred to answer questions over the phone or through Skype tended to provide a much richer response since voice interviews allow a more conversational type of interview to take place. However, some phone interviews were very short and less rich in content for participants who had limited time. Moreover, conducting interviews outside of the social media sites tended to facilitate a richer reflection of social media use than interviews that were conducted within the social media service. Still, the quality of the interview depended on a variety of other factors (e.g., the participant's time and style of engagement, how I contacted the participant and asked the interview questions, the interviewee's interest in participating, etc.).

4.2.3 Automated Collection Methods for Collecting Crisis-specific Datasets

The final type of data collection method employed was a computational method to collect crisis-specific data publicly available online. As one passive but helpful strategy, Google Alerts[51] were created for each crisis using the following search terms: Bhopal, Bhopal disaster, September 11 attacks, 9/11 attacks, Hurricane Katrina, and climate change. For each search term, "all types of content" were collected and sent to my email once a day as well as to a RSS feed in real-time. An algorithm created by Google powers this alert service accompanied by a user-friendly interface that allows me to easily find relevant online artifacts to include during my qualitative research studies. The purpose of using the Google Alerts service was to monitor whether or not these crises still had an active presence online.

[51] http://www.google.com/alerts

A high-tech strategy was also employed to collect crisis-specific Twitter data by taking advantage of the Twitter collection strategies already in place at my research lab.[52] Twitter data were collected using the Twitter Search API[53] and the Twitter Streaming API[54] to locally archive publicly available tweets containing the case-insensitive keywords indicated in Table 4. The data collection period took place on the anniversary dates of the Bhopal gas leak, the September 11 attacks, and Hurricane Katrina, since I anticipated that digital commemoration activities would occur in Twitter for these historic crisis events. For climate change, the collection period centered on global events related to climate change and global warming (e.g., the COP15 conferences, Earth Day, Earth Hour, 350 global work party, etc.). Table 4 presents the number of tweets, Twitter users, hashtags, and URLs collected for each crisis event.

Crisis Event	Collection Date	Keywords	# of Tweets	# of Users	# of #Tags	# of URLs
Bhopal Gas Leak	9/2 – 12/20 2010	Bhopal	6,308	3,323	531	2,779
September 11 Attacks	9/11 – 9/12 2009 9/1 – 10/18 2010	9/11, neverforget, September 11	119,264	78,380	7,000	27,617
Hurricane Katrina	8/27 – 9/7 2010	Katrina, hurricanekatrina	82,160	49,685	4,379	24,117
Climate Change	10/15 – 12/10 2010	Climate, cop15, cop16, 350ppm, 350, earthhour, climatechange, climatejustice	207,400	105,429	14,134	43,205

Table 4: Number of Tweets for Each Crisis-specific Twitter Dataset

The purpose of collecting these datasets was to compare and contrast the Twitter content to the narratives that emerged in the other social media services I investigated in the qualitative

[52] Researchers from the Project EPIC lab at University of Colorado at Boulder, namely Professor Ken Anderson as well as Aaron Schram and Mossaab Bagdouri, assisted in the collection of this Twitter data.
[53] http://search.twitter.com/api
[54] http://dev.twitter.com/pages/streaming_api

research studies described in the previous section. Specific tweets were selected if they were relevant to the crisis narratives I found for each crisis event.

4.2.4 Data Analysis: An Interpretive Approach

Conducting a study on each of the three crisis events (i.e., the Bhopal gas leak, the September 11 attacks, and Hurricane Katrina) is similar to Yin's (2003) "multiple-case studies" design, but each crisis is not treated as a case study in this dissertation. However, given that much of my data are from and about the web and specifically social media services, I chose to adapt Schneider and Foot's (2005) "web sphere analysis" framework to more accurately describe these parallel crisis cases as web spheres. Two types of web spheres were constructed in Phase 2: (1) the four web spheres created for each crisis event containing five types of data as depicted in Figure 9 and (2) the web sphere containing the aggregate of these four web spheres allowing for comparisons across these different crises as depicted in Figure 10. The boundaries of each of the three web spheres were bounded by a set of keywords and phrases associated with each crisis. The boundaries of these web spheres were fixed by searching and collecting social media content specifically from English Wikipedia, Facebook, Flickr, YouTube, Twitter, and blog posts. I also interviewed 16 participants for three crisis events and 9 participants for the climate change crisis case and used a similar method for obtaining data through Google Alerts and from Twitter.

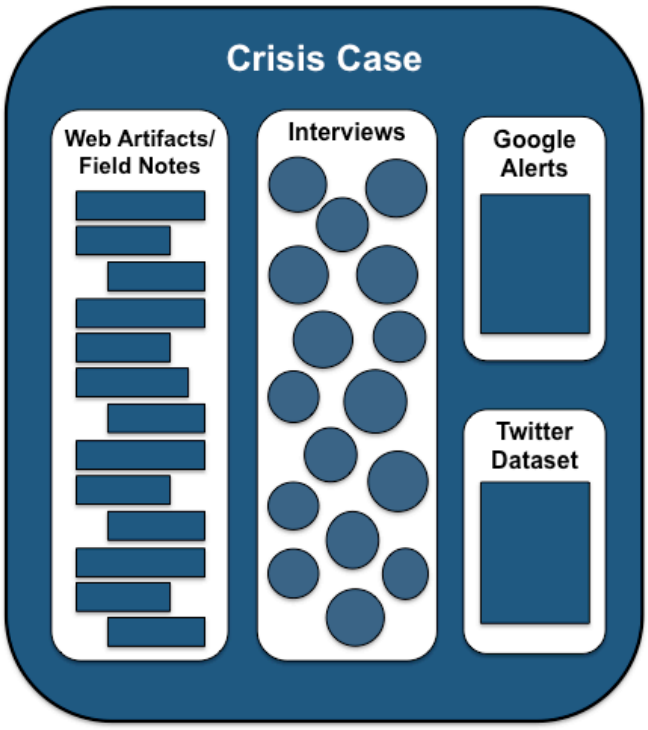

Figure 9: Data Types Collected for Each of the Four Crisis Cases or Web Spheres

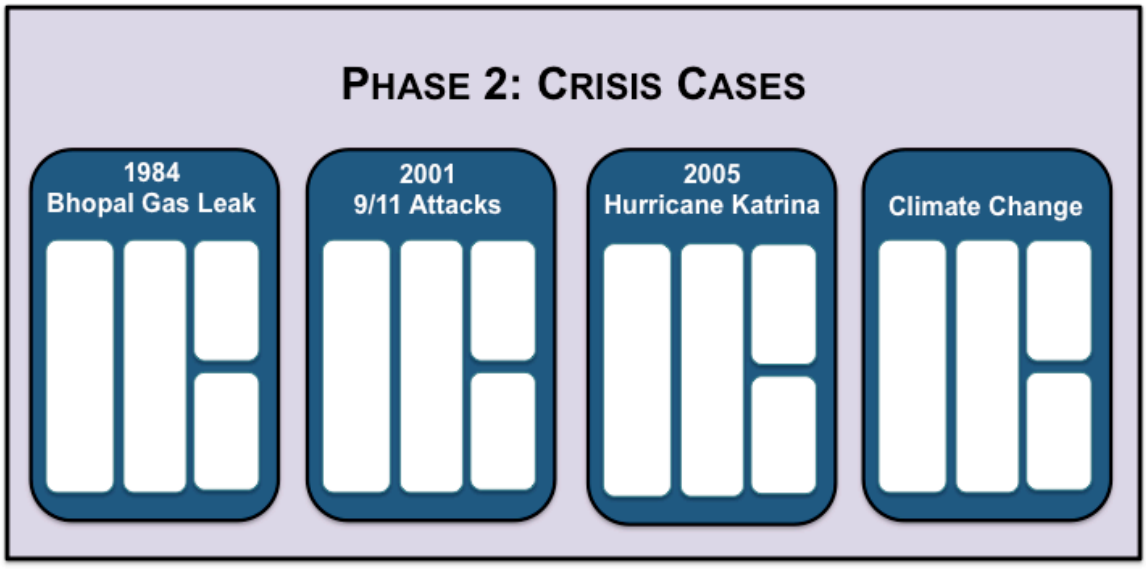

Figure 10: Four Crisis Cases as One Aggregate Web Sphere

After identifying web artifacts that referenced other relevant websites, a "dynamic bounding process" was necessary to include new websites like History Commons.[55] I also anticipated significant bursts of online action or what Schneider and Foot (2005) refer to as "web storms"—"a unit of analysis that reflects inter-actor and inter-site activity over a relatively brief period of time" (p. 162)—within each of these web spheres during each crisis event's anniversary date, and collected data during this time period. Unanticipated bursts of activity also occurred when people discussed current events related to my three crisis events (e.g., the 2010 Bhopal verdict, the 9/11 health bill, and the effects of the BP oil spill to those who were affected by Hurricane Katrina). Dynamic bounding proved to be a valuable web sphere technique because it was a way of determining if the crisis narratives were still developing and being kept alive.

Although the "web sphere analysis" framework suggests using web archiving techniques to preserve the ephemerality of web content (Schneider and Foot, 2005) and recreate the web experience (Arms et al., 2001), web archiving activities were limited in this research for ethical and legal reasons. The Terms of Service for some social media services (i.e., Facebook,[56] YouTube,[57] and Flickr[58]) have strict policies, whereas other social media services (i.e., Twitter[59] and Wikipedia[60]) have more flexible Terms of Use policies; therefore, I chose not to use web archiving techniques for Facebook, YouTube, and Flickr. Also, most of the Flickr photos examined were copyright protected. However Twitter data was locally archived using computational methods, as discussed in Section 4.2.3, because tweets are considered publicly available as well as legally downloadable. Since Twitter does not make their entire archive of tweets publicly available, this data needed to be locally archived for research purposes.

[55] http://www.historycommons.org
[56] http://www.facebook.com/terms.php
[57] http://www.youtube.com/static?gl=US&template=terms
[58] http://www.flickr.com/atos/pro
[59] http://twitter.com/tos
[60] http://wikimediafoundation.org/wiki/Terms_of_Use

Systematically archiving Twitter data was ethical and appropriate since Twitter has already made an agreement to make all public tweets available to the Library of Congress,[61] meaning that Twitter has chosen to make all public tweets accessible for posterity.

The ephemerality of Twitter compelled me to locally archive this web content so that I could analyze this data at a later time. However, sites like Facebook, YouTube, and Flickr are often treated as dynamic, ad hoc archiving services meant to sustain the permanence of particular social media content while still allowing the content on these sites to be ephemeral and delete-able. Therefore, the philosophy I chose was to investigate these web spheres in their natural setting online and only archive ephemeral content like Twitter that could not be easily analyzed through the Twitter Search website. I wanted to treat these social media sites as "living" archives and maintain the notion of heritage as a "living system" by not trying to black box these research sites. To handle copyright issues, the creators of the social media content presented here were asked permission to republish their data in this dissertation.

To analyze the four web spheres generated in Phase 2, computer-based services were used to organize all the data collected for this study. Theoretical perspectives from the disaster and heritage studies literature were also used to guide the coding process. This section describes the computer-based services used, provides an overview of the analytic process, and discusses the theoretical perspectives used to guide the analytic process.

Two software programs and one web service were used to collate the wide variety of data collected for this study. Zengobi's software product called Curio[62] as a digital notebook was initially used for gathering my field notes, the social media and web content, and my interview transcripts into one place. Curio allowed me to quickly drag and drop my digital data thus

[61] http://blogs.loc.gov/loc/2010/04/how-tweet-it-is-library-acquires-entire-twitter-archive
[62] http://www.zengobi.com/products/curio

supporting a more visual process of gathering and organizing these diverse data types. I also was able to insert a "WebView" in the Curio idea spaces, which is a web browser embedded within the idea space to create a live view of any web page. This was an alternative to creating a screenshot by allowing me to quickly access and analyze pertinent web content I chose to include in this research study.

Then, Mariner's software product called MacJournal[63] was used because it provided better support for organizing text-based data. The MacJournal interface was simple and allowed me to quickly tag the data to facilitate the qualitative coding process that I discuss in more detail below. Last, Delicious (a social bookmarking web service that uses a non-hierarchical classification system for tagging web bookmarks and discovering other people's web bookmarks) was used to bookmark and tag the web content I analyzed for this study. The purpose of using Delicious was to quickly organize and find the websites I focused on and to make these selected websites publicly available and easily accessible in one place. Using these three computer-mediated programs facilitated the triangulation of the diverse types of data I collected for each crisis case.

The qualitative analysis approach that I employed is based on Spencer, Ritchie, and O'Conner's (2003) "analytic hierarchy" framework as shown in Figure 11. This is a conceptual scaffolding approach to qualitative data analysis that involves iterative development of the qualitative findings from the raw data. This multi-stage process is a way of moving from data management to creating descriptive accounts and then finally more explanatory accounts. The first step was to identify themes and concepts that emerged from the raw data across all three crises using *in vivo* terms, which are terms taken directly from the data or used directly by the

[63] http://www.marinersoftware.com/products/macjournal

participants themselves. This initial "coding" process entailed labeling the data based on these terms and then clustering or chunking the data into thematic categories (Lofland and Lofland, 1995; Rossman and Rallis, 1998). Theoretical perspectives from the disaster studies and heritage studies literature also guided the process of developing these thematic categories.

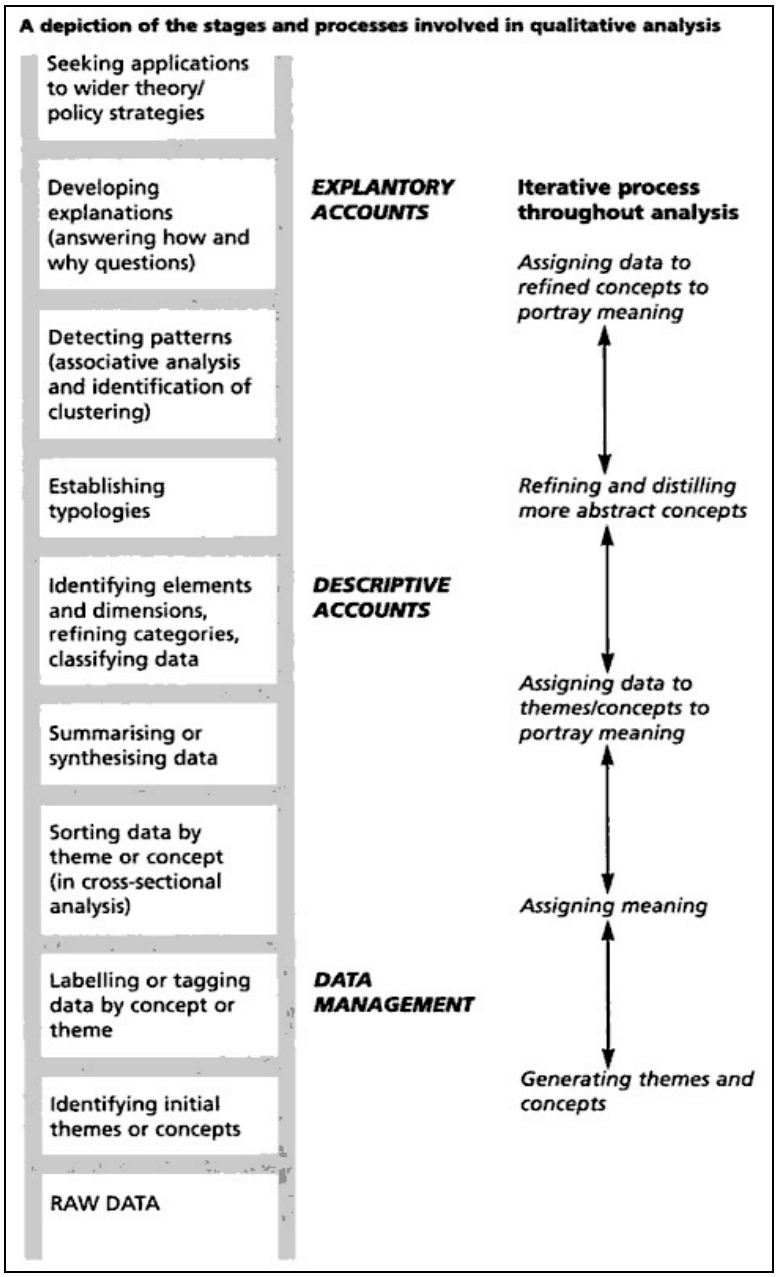

Figure 11: Analytic Hierarchy (Spencer, Ritchie, and O'Connor 2003)

After analyzing the web spheres for each of the four crisis cases, I found a collection of smaller narratives across the four crises and across different social media services. I then organized these smaller narratives into higher-level categories, which resulted in five meta-narratives. The following five meta-narratives emerged from analyzing the data across all four crises: (1) **cause**: narratives about the cause of the crisis, (2) **survivor**: narratives about victims or from eyewitnesses, (3) **ongoing effects**: narratives about the continuous nature of the crisis, (4) **scientific or vetted**: narratives from sources perceived as reputable, and (5) **direct action**: narratives about social and political actions. Each of the four crises had a different representation across the different meta-narratives. For example, the September 11 attacks tended to have more survivor narratives than the Bhopal gas leak, which is in part due to the differences in memory technologies available at the time of these crises.

These five meta-narratives reflect the voices that result when crisis remembrance meets social action. More specifically, the cause, survivor, and ongoing effects meta-narratives are voices that demonstrate how the commemoration of a disaster is a social process that contains multiple dimensions of the hazard agent, how disasters produce multiple interpretations, and how disasters are not isolated or temporally demarcated events (Oliver-Smith, 2002). The scientific and direct action meta-narratives are voices that demonstrate how the heritage of historic crisis events has social significance and thus are voices that engender social action (Byrne, 2008).

After analyzing the web spheres of the four crises and discovering these five meta-narratives that emerged from these web spheres, I then produced two long descriptive analyses synthesizing the living heritage of the 1984 Bhopal gas leak and the 2001 September 11 attacks. These five meta-narratives guided the organization of the narratives for these two crisis cases, which are presented in Chapters 7 and 8 respectively. Although other types of meta-narratives

likely exist, these five meta-narratives are conceptually broad enough to cover a large portion of the narratives that exist in the social media landscape for these crises.

4.3 Summary

This chapter provided an in-depth description of the two-phase research design for the *Part 1: Investigating Crisis Narratives* studies. Virtual methods using ethnographic techniques, automated collection methods, and methodological issues that arose from conducting online research were discussed. The next chapter describes the research design employed for the *Part 2: Critiquing Curation* study, which was concurrently conducted during the *Part 1: Investigating Crisis Narratives* study. Therefore, many of the data collection and analysis processes overlapped and informed one another.

CHAPTER 5
CRITIQUING CURATION

This chapter describes the research methods used to conduct a study that critiqued the concept of curation. The goal of this study was to answer Part 2 Research Questions:

Part 2 Research Questions: What activities are associated with curation?
What kind of curation is taking place through social media?

This study was conducted in two phases. Phase 1 consisted of unpacking the concept of curation in the social media landscape and critically analyzing the role curators typically play in cultural heritage institutions. Section 5.1 explains the methods used to unpack curation. Phase 2 consisted of analyzing the findings from Phase 1 to develop an initial conceptual model of curation, which is described in Section 5.2. Figure 12 provides an overview of this two-phase process in this study.

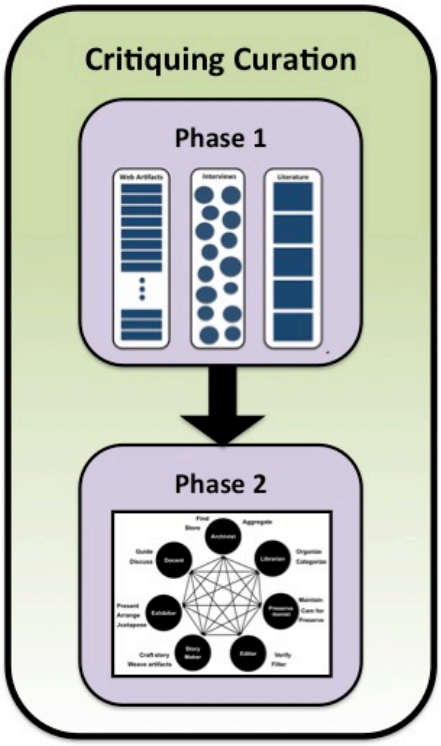

Figure 12: Overview of Part 2: Critiquing Curation Studies

Section 5.3 explains how the findings from *Part 1: Investigating Crisis Narratives* and *Part 2: Critiquing Curation* were brought together to assess the initial model and develop a final theoretical model called *socially-distributed curation*, as illustrated in Figure 3.

5.1 Phase 1: Unpacking the Concept of Curation

Phase 1 consisted of conducting qualitative studies to investigate the concept of curation. Section 5.1.1 explains how I collected blog posts and other web content that discussed concepts related to curation in the social web world. Section 5.1.2 explains how I interviewed curation experts. Lastly, Section 5.1.3 explains how I conducted a critical analysis of the literature on the role of curators. Figure 13 provides an overview of the types of data collected in this phase.

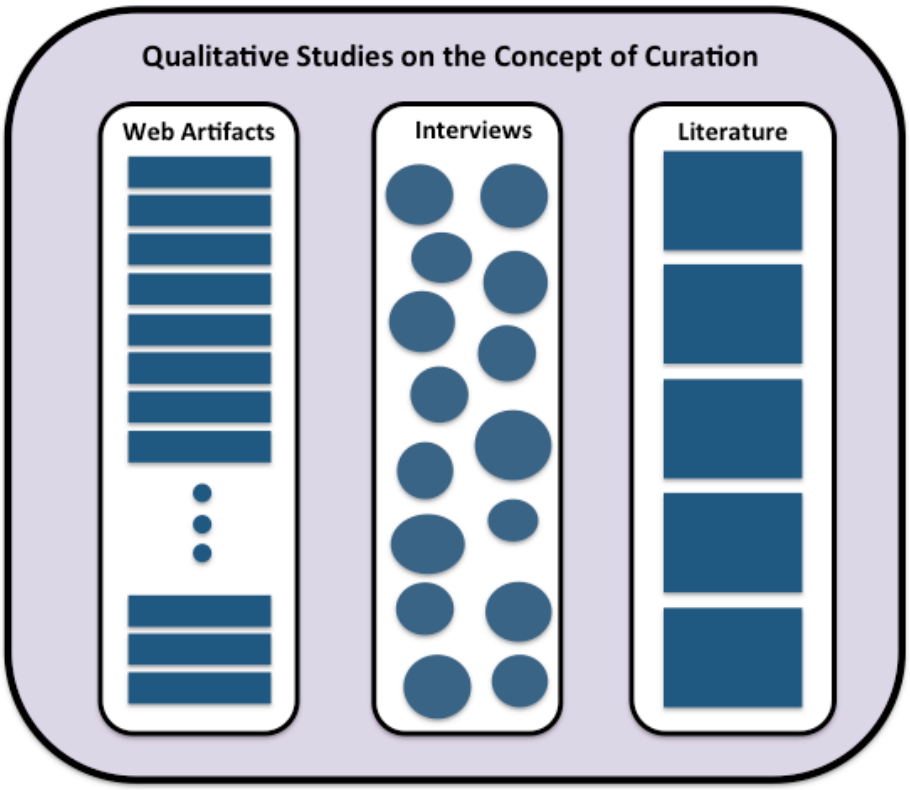

Figure 13: Diagram of the Datasets Collected for Part 2: Critiquing Curation Qualitative Study

5.1.1 Collecting Curation-related Web Artifacts

In Phase 1 of the *Critiquing Curation* study, I investigated the meaning of *curation* based on a distillation and collation of how web users explained the term curation in the online context within social media services. Approximately 250 web artifacts pertaining to curation in the social web context were collected and analyzed. These artifacts included blog posts, online news articles, videos, and the comments within each of these posts. Web services that claimed to support curation were also examined to understand the design of existing data curation tools. I again conducted documentary research by treating these web artifacts as "natural documents" (Have, 2004). These web artifacts were seen as primary resources to better understand how the role of the *curator* in the physical world transformed into a *curation* process in the online world and how curation is being defined and used to inspire technology design.

To more easily organize and share these web artifacts for research purposes, I publicly bookmarked these artifacts using my *Grassroots Heritage* Delicious[64] account. Chapter 10 provides excerpts on how social media experts and curation professionals explain the value of curation in the context of the social web world. Similar to the automated collection methods mentioned in Section 4.2.3, I also created a Google Alert using "curation" as the search term providing another stream of web artifacts to keep me updated on how people were currently using the term curation online.

5.1.2 Interviewing Curation Experts

Interviews were also conducted to further investigate the concept of curation. I interviewed 15 participants that exhibited expert knowledge on the role of curators within cultural heritage institutions, conducted work in the area of digital history and heritage relevant to curation, wrote about curation in their web posts, and/or developed technology that facilitated

[64] http://www.delicious.com/grassrootsheritage/curation

curation. These interviews were conducted face-to-face, over the phone, via email, through Skype, and/or instant messaging (see Section 4.2.2 for details on this interview process). Participants were asked the following open-ended questions about curation:

- How do you define curation?
- What kinds of activities are typically associated with curators?
- What kind of curatorial activities are you noticing online within social media sites?
- What kind of curation process do you engage in online?
- How is curation designed into your technological system?

Based on preliminary findings from the web artifacts and these interviews, it became clear that a variety of meanings were associated with the word "curation." The next step was to analyze the historical roots of curators and then compare them with the ways in which curation is being discussed in the social web world.

5.1.3 Critical Analysis of the Literature on Curators and Curating

A critical analysis of literature discussing the role of curators in the past and their evolving role in the present was also conducted. Five pieces of literature were carefully evaluated to better understand the historical roots of curators and curation as a professional discipline.

The first piece is an article by Chambers (2006) entitled "Defining the Role of the Curator," which provided a brief overview of the different roles associated with curators who work at museums. The second piece is a definitive reference book edited by Thompson (1992) entitled *Manual of Curatorship: A Guide to Museum Practice* providing a broad survey of articles associated with curatorship in the museum context. The third piece is a book edited by

Marincola (2000) entitled *Curating Now: Imaginative Practice/Public Responsibility* containing proceedings from an international group of influential curators at a symposium addressing the state of current curatorial practice. The fourth piece is an edited book volume by Thea and Micchelli (2009) entitled *On Curating // Interviews with Ten International Curators* exploring the complex negotiations that curators face in the art exhibition context. The fifth piece is a book by Graham and Cook (2010) entitled *Rethinking Curating: Art after New Media* illustrating how the role of curators are being redefined by the characteristics of new media art and the new modes of curating emerging from social networking sites.

The purpose of critically analyzing these diverse pieces of literature was to obtain a strong theoretical, historical, and intellectual foundation of curation. I compared findings from critically analyzing the curation literature, the interviews, and the qualitative data collected on curation in the social web world to inform the development of a curation model in Phase 2.

5.2 Phase 2: The Initial Conceptual Model of Curation

Phase 2 of the Critiquing Curation study consisted of developing an initial conceptual model of curation (Figure 14). As mentioned in Section 4.2.4 regarding my analytical methods, a multidimensional typology of curation was generated after analyzing the data from the qualitative studies and the critical analysis of the literature on curators collected in Phase 1 of the Curation study. An inductive analytic process was used to build an affinity diagram, which is a user-centered design technique for organizing individual ideas and insights into a hierarchy to show common themes and structures (Holtzblatt et al., 2005). *Socially-distributed curation* emerged as a concept after conducting the analytic hierarchy process on the data generated in Phase 1 of this study. Chapter 10 is devoted to presenting the findings from the curation studies and explaining the curation model in more detail.

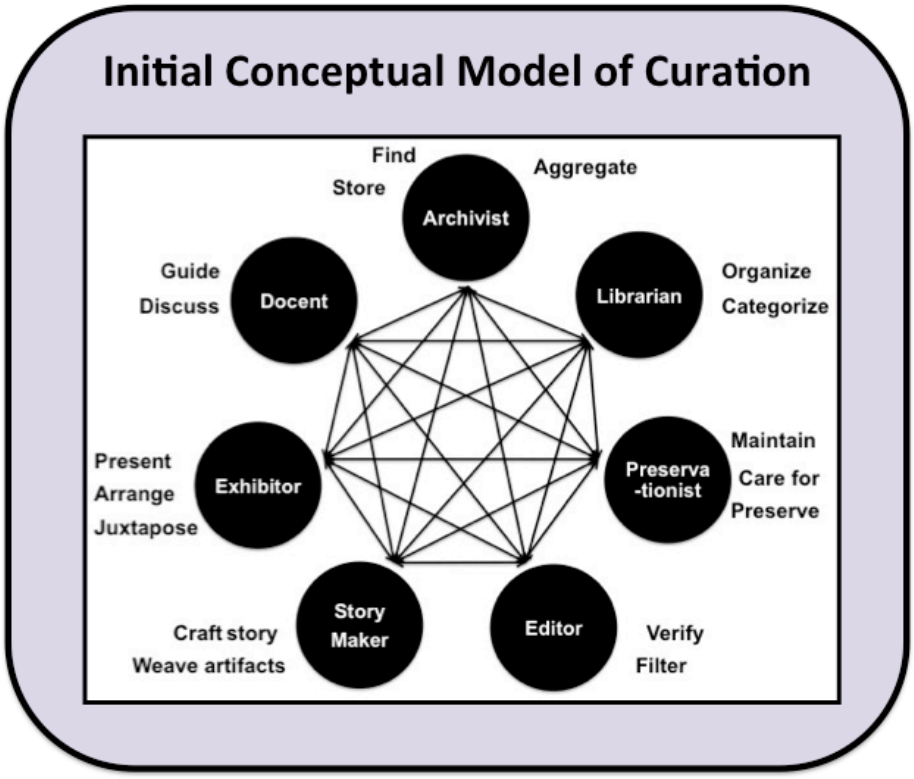

Figure 14: Diagram Depicting the Initial Conceptual Model of Curation Developed in Part 2

5.3 Developing a Theoretical Model of Socially-Distributed Curation

The final phase of the research study involved assessing the initial conceptual model of curation with the crisis narratives I found in two crisis cases (i.e., the 1984 Bhopal disaster and the 2001 September 11 attacks). The goal of this study was to answer Part 3 research question:

Part 3 Research Question: Did the curation activities defined in Part 2 occur for the crisis narratives found in Part 1? How did they vary?

Much of the social media activity that shaped the crisis narratives was in part due to users curating online content. They used sociotechnical systems to find and compile meaningful crisis-related memories shared by others. These memories contained the many voices that have contributed to the collective narratives presented for each crisis.

After conducting the Crisis Narratives and the Curation studies concurrently, these two studies came together by using the findings from the crisis narratives study to develop a theoretical model of socially-distributed curation. Since this model has the potential to provide tangible design implications, the model needed to be validated first. During the in-depth investigations of the two crises I focus on in this dissertation, I collected data pertaining to how the crisis narratives were created, shared, and ultimately curated. I also analyzed the form and structure of the social media sites using the *specimen/features* approach (Have, 2004; Schneider and Foot, 2005), as I previously mentioned in Section 3.4.3. This helped to determine how the design of the social media services facilitated the creation and preservation of the crisis narratives. Analyzing the features within social media services and the behaviors surrounding the use of these features informed the type of curatorial activities I found in practice. In this final phase of the research, the goal was to determine whether or not the crisis narratives were curated in the ways delineated in my curation model. Chapter 9 is devoted to illustrating examples of how the crisis narratives were curated based on the different curatorial activities represented in the curation model.

5.4 Summary

This chapter provided a detailed description of the two-phase *Critiquing Curation* study. Phase 1 consisted of unpacking the concept of curation in the social media landscape accompanied by a critical analysis of the literature discussing the role curators play in cultural heritage institutions. Phase 2 involved the development of an initial conceptual model of curation. The last section of this chapter briefly discussed the methods employed in Part 3 that led to the development of a theoretical model of *socially-distributed curation*. The methods and analysis employed in Part 3 are discussed in more detail in Chapter 9.

***

This concludes the three chapters in Part II: Research Design. Chapter 3 explained the exploratory research phase, my research questions and research design, and methodological approaches that I considered for conducting online research. Chapter 4 explained how I conducted a survey of social media presence for 111 crisis events and how I conducted in-depth investigations for four specific crisis events. Chapter 5 explained the methods I used to critique the concept of curation in order to develop an initial conceptual model of curation. The findings from the studies conducted in *Part 1: Investigating Crisis Narratives* and *Part 2: Critiquing Curation* were then linked together in *Part 3: Developing a Theoretical Model* with the purpose of assessing the initial conceptual model of curation and developing a theoretical model of socially-distributed curation based on the curatorial activities that produced the crisis narratives in the social media landscape.

PART II: GRASSROOTS HERITAGE

Part II consists of four chapters that constitute the descriptive explanations of the research findings that emerged from the studies conducted in the three-part research design.

Chapter 6 explains the research findings from the survey of social media presence for 111 crisis events. This chapter provides a broad overview of how social media sustain the heritage of historic crises that ocurred over the past two generations.

Chapter 7 presents the living heritage of the 1984 Bhopal gas leak emerging in the social media landscape. Likewise, Chapter 8 presents the living heritage of the 2001 September 11 attacks emerging in the social media landscape. Both chapters are organized based on the following five meta-narratives: (1) **cause**: narratives about the cause of the crisis, (2) **survivor**: narratives about victims or from eyewitnesses, (3) **ongoing effects**: narratives about the continuous nature of the crisis, (4) **scientific or vetted**: narratives from sources perceived as reputable, and (5) **direct action**: narratives about social and political actions.

Chapter 9 presents the findings from a study that unpacked the formal concept of curator as well as the findings from a study that unpacked the informal concept of curation in the social web world. This led to the development of an initial conceptual model of curation, which was then assessed to produce a final theoretical model called *socially-distributed curation*.

The research findings presented in these four chapters are empirical evidence of a living phenomenon I call *grassroots heritage*. This living heritage includes narratives (i.e., the stories, memories, and their messages) and an explanation of the curatorial activities that create and sustain these narratives.

CHAPTER 6
SOCIAL MEDIA PRESENCE FOR 111 CRISIS EVENTS

This chapter presents the findings from *Part 1: Survey of Social Media Metrics for 111 Crisis Events* explained in Chapter 4. The purpose of this survey is to obtain a broad overview of the crisis commemoration trends taking place in the social media landscape and to inform the selection of which crises to investigate in more detail. The following is a summary of the findings from this study:

- People are using social media to digitally commemorate certain historic crises.
- Social and technological hazards that occurred before the social media age tended to exhibit a higher social media presence than natural hazards.
- Commemorations of past crises often occur when they are linked to recent crises that exhibited similar causes, effects, and vulnerabilities.
- The type of social media content being shared to commemorate past crises are, broadly speaking, representations of reminiscing, memorializing, the hazard agent and its impacts, preparedness efforts, official and scientific reports, the impact zone in the present day, and related current events.
- The crisis-related social media artifacts people create and share online are attempts to encourage others to commemorate crises and sustain the living heritage of these crises.

This chapter presents the empirical evidence of these findings in nine sections. The first section explains how the quantitative social media metrics were analyzed and presents specific crisis events that exhibited a high social media presence across these quantitative metrics. The next seven sections explain the social media presence of historic crises specific to the following social media services: Wikipedia, Facebook, Flickr, YouTube, the blogosphere, Twitter, and open digital archives. Each section explains the quantitative and qualitative findings for each social media service. The last section discusses the broader implications of these findings from this survey of social media in the crisis domain.

6.1 Top Crisis Events Across All Quantitative Social Media Metrics

This section specifies the crisis events that maintained a high presence across 17 quantitative social media metrics (Table 5). The first subsection explains the process of analyzing these metrics. The second subsection presents the findings from this analysis.

Social Media	Quantitative Metrics
Wikipedia (4)	# of Edits # of Edits per Day # of Editors # of Watchers
Facebook (3)	# of Groups # of Causes # of Fan Pages
YouTube (2)	# of Videos # of Playlists
Flickr (2)	# of Images # of Groups
Delicious (1)	# of Bookmarks
Digg (1)	# of Digg Results
Blogs (1)	# of Blog Posts
Mashups (1)	# of Spatiotemporal Mashups
Digital Archives (2)	# of Internet Archive Results # of Archive-It Results

Table 5: 17 Quantitative Social Media Metrics

6.2 Analysis Process

Figure 15 illustrates the key components for analyzing the 17 quantitative social media metrics for the selected 111 crisis events. Each of the 17 quantitative social media metrics contained two columns. The first column is the crisis event color-coded based on type of hazard—natural hazard events are green, social hazards are red, and technological hazards are blue. The second column is the quantitative metric associated with the crisis event and color-coded based on its technological age—*pre-web age* events (1960 – 1992) are orange, *web-age* events (1993 – 1998) are yellow, and *social media age* events (1999 – 2010) are light yellow.

To determine whether a crisis event exhibited a high presence within each quantitative social media metric, I first sorted from highest to lowest all 111 crisis events for each of the 17 quantitative metrics. For example, the crisis event that had the highest number of Flickr photos appeared at the top of the list and the crisis event that had the lowest number of Flickr photos appeared at the bottom of the list. Then, I demarcated the Top 10 crisis events that had the highest number of Flickr photos, the Top 25 crisis events (which includes the Top 10 plus the next 15), and the Top 50 crisis events (which includes the Top 25 plus the next 25). This was done for all 17 quantitative metrics; therefore, each crisis event was sorted within each of the 17 metrics. Then, I tallied the number of times a crisis event appeared in the Top 10, the Top 25, and the Top 50 across all 17 metrics. Therefore, there were 17 lists with all 111 crisis events sorted from highest to lowest; I refer to these lists as the "17 sorted lists."

Table 6 displays 39 crisis events that exhibited a high social media presence based on the findings from the 17 quantitative metrics. The first ten crisis events are those that occurred during the "pre-web age" (1960–1992). The next five crisis events are those that occurred during the "web age" (1993–1998). The last twenty-five crisis events are those that occurred during the "social media age" (1999–2010). These 39 crisis events appeared in the Top 10, Top 25, and Top 50 of the 111 crisis events and appeared in at least 9 of the 17-sorted lists. The red bar indicates the number of times that crisis event appeared in the Top 10 crisis events across all 17 sorted lists. The blue bar indicates the number of times that crisis event appeared in the Top 25 crisis events across all 17 sorted lists, in other words, the number of times the crisis event was ranked between the 11^{th} and 25^{th} crisis event for each of the 17 sorted lists. The green bar indicates the number of times that crisis event appeared in the Top 50 crisis events across all 17 metrics, in other words, the number of times the crisis event was ranked between the 26^{th} and 50^{th} crisis

event for each of the 17 sorted lists. The total number of times each of these 39 crisis events appeared across all the 17 sorted lists appears at the end of the bar.

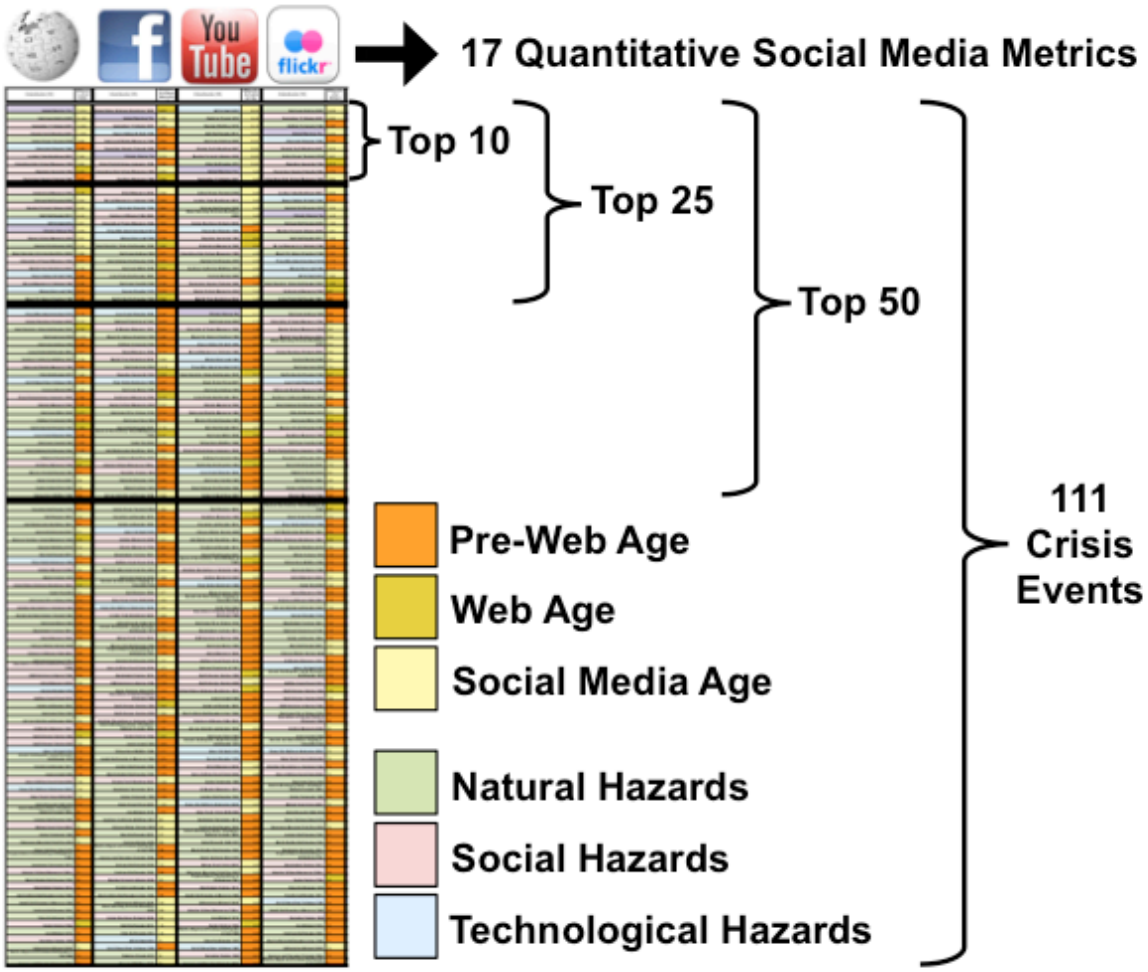

Figure 15: Illustration of Analysis for Surveying Social Media

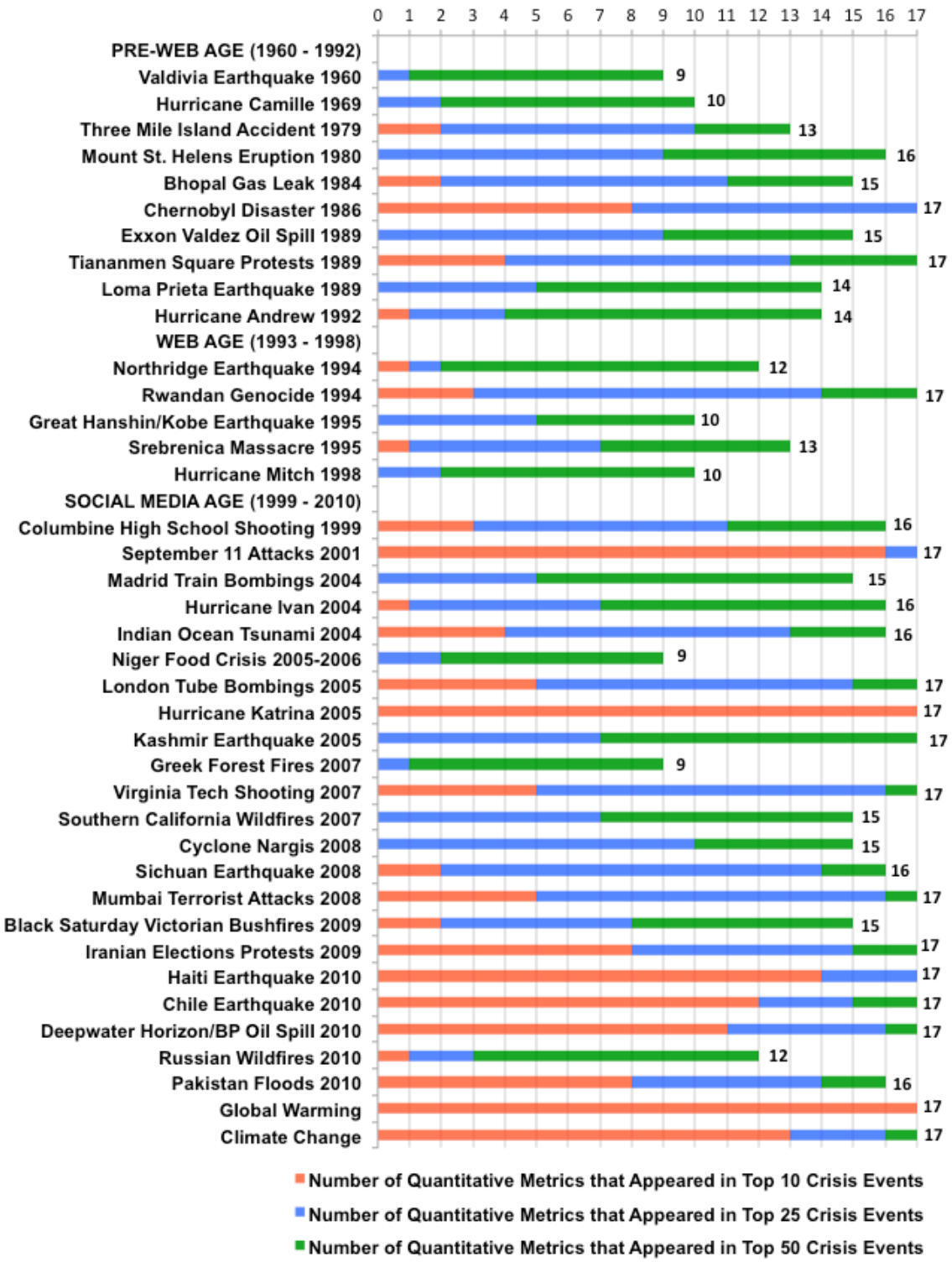

Table 6: 39 Crisis Events with a High Social Media Presence
(Based on Analyzing the 17 Quantitative Social Media Metrics Listed in Table 5)

There are two reasons for visualizing these 39 crisis events in this way: (1) To show which events had a higher social media presence when compared to the other crisis events and (2) to provide more granularity in how high of a social media presence each crisis event is by specifying the number of times it appeared in the Top 10, Top 25, or Top 50 for the 17 quantitative metrics. For the crisis events that have a long red bar, this indicates that this event appeared more frequently in the Top 10 across multiple quantitative metrics and thus has a higher social media presence than those that have a short red bar. However, it is worth noticing the amount of presence a crisis event has when it is considered in the Top 25 and Top 50. In other words, the events that have a longer blue bar have a higher social media presence than those that have a long green bar, but the total number of times the event appears across all 17 quantitative metrics should also be considered. Therefore, the purpose of Table 7 is to show the data in a way that does not conflate all the quantitative findings but still allows for comparison between all the top crisis events with a high social media presence across all 17 quantitative metrics. Below I discuss the crisis events that exhibited a high social media presence within each of the three technological ages (i.e., pre-web age, web age, and social media age).

6.2.1 Social Media Presence for Pre-Web Age

Of the 61 crisis events that took place during the "pre-web age" (1960 – 1992), the **1986 Chernobyl disaste**r exhibited the highest social media presence in comparison to other pre-web age crises. This event appeared in the Top 10 crisis events for eight of the 17 quantitative metrics, and in the Top 25 crisis event for nine of the 17 quantitative metrics. The **1989 Tiananmen Square protests** exhibited the second highest presence since it appeared in the Top 10 events for four of the 17 quantitative metrics, as well as appeared in the Top 25 events for nine of the quantitative metrics and in the Top 50 for four of the quantitative metrics.

Although the 1980 Mount St. Helens Eruption had a higher number of instances in which it appeared in the 17 sorted lists, this event may be comparable to the 1984 Bhopal gas leak and the 1979 Three Mile Island accident since these two events appeared as the Top 10 events for two of the quantitative metrics. However, the **1984 Bhopal gas leak** has a higher social media presence, since it appeared in the Top 25 events more frequently than the Three Mile Island accident and it appeared in 15 of the 17 sorted lists. The **1979 Three Mile Island accident** appeared in 13 of the 17 sorted lists. Still, the **1989 Exxon Valdez oil spill** has a higher social media presence than the Three Mile Island accident but not as high of a presence as the Bhopal gas leak since this oil spill does not appear in the Top 10 for any of the quantitative metrics. The **1989 Loma Prieta earthquake** and the **1992 Hurricane Andrew** also exhibit more of a presence than the Three Mile Island accident.

6.2.2 Social Media Presence for Web Age

Of the 10 crisis events that took place during the "web age" (1993 – 1998), the **1994 Rwandan genocide** exhibited the highest social media presence since it appears in all 17 sorted lists. The **1995 Srebrenica massacre** has the second highest presence, since it appeared in the Top 10 crisis events for one of the quantitative metrics as well as appeared in the Top 25 for six of the quantitative metrics and in the Top 50 for six of the other quantitative metrics. The other three web age crisis events that exhibited a high social media presence are natural hazards, namely the **1994 Northridge earthquake**, the **1995 Great Hanshin or Kobe earthquake**, and the **1998 Hurricane Mitch**.

6.2.3 Social Media Presence for Social Media Age

Of the 38 crisis events that took place during the "social media age" (1999 – 2010), the **2005 Hurricane Katrina** showed the highest social media presence in comparison to other social media age crises since this crisis appeared in the Top 10 crisis events across all 17 quantitative metrics. The **2001 September 11 attacks** showed the second highest presence, since this crisis appeared in the Top 10 crisis events for 16 of the 17 quantitative metrics and in the Top 25 for one of the quantitative metrics. The **2010 Haiti earthquake**, the **2010 Chile earthquake**, and the **2010 Deepwater Horizon/British Petroleum (BP) oil spill** are the next crisis events with a high social media presence; however, their high presence may in part be because they occurred just months before this survey data was collected.

One might conclude that crisis events that happened more recently tend to have a higher social media presence; however, the social media presence for the **2010 Russian wildfires** and the **2010 Pakistan floods** do not have as high of presence. This may in part be because these events were still happening at the time of the data collection and did not yet reach a high social media presence yet. **Global warming** and **climate change** also show a very high social media presence. Although some would argue that these crises were documented as far back as the 1800s with impacts beginning at the start of the Industrial Revolution, it is only recently in the past five years that these crises have been discussed and debated more frequently.

6.2.4 Social Media Presence Based on Type of Hazard and Casualties

In addition to finding specific crisis events with a high social media presence, Table 7 color-codes the 39 crisis events based on type of hazard. Natural hazard events are green, technological hazards are blue, and social hazards are red. The top part of the table shows the 15 crisis events that occurred during the pre-social media age (1960 – 1998). Although some comparisons can be made among the five web-age crisis events, more significant findings can be

drawn when these crisis events are combined with the pre-web age since the purpose of this study is to find trends in crisis events that occurred before the emergence of social media. The bottom part of the table shows the 24 crisis events that took place during the social media age (1999 – 2010). The crisis events are sorted based on the total number of times they appear across the 17 quantitative metrics. The second column in Table 7 indicates the percentage of this.

The pre-social media age crisis events that have a higher presence are primarily technological and social hazards. The 1986 Chernobyl disaster, the 1984 Bhopal gas leak, and the 1989 Exxon Valdez oil spill are technological hazards with the highest presence. The 1979 Three Mile Island accident has a high presence but not as high as the 1989 Loma Prieta earthquake or the 1969 Hurricane Camille. The 1989 Tiananmen Square protests and the 1994 Rwandan genocide are social hazards that showed the highest presence, while the 1995 Srebrenica massacre has the same amount of presence as the Three Mile Island accident. Natural hazard events like the 1980 Mount St. Helens eruption, the 1989 Loma Prieta earthquake, and the 1992 Hurricane Andrew have a high presence but not in comparison to the technological and social hazards. Although this manually conducted survey of social media and crisis events was hard to sample very accurately, **the trends in the data suggest that technological and social hazards that occurred during the pre-social media age tend to have a higher social media presence than natural hazards.** This provides an indication that future technological and social hazard events may maintain a higher media presence over a longer period of time than natural hazard events.

PRE-SOCIAL MEDIA AGE (1960 - 1998)	% of Quant Metric	# of Deaths	# of Injured
Chernobyl Disaster 1986	100%	56	4,000
Tiananmen Square Protests 1989	100%	3,000	
Rwandan Genocide 1994	100%	800,000	
Mount St. Helens Eruption 1980	94%	57	
Bhopal Gas Leak 1984	88%	8,000	150,000
Exxon Valdez Oil Spill 1989	88%		32,000
Loma Prieta Earthquake 1989	82%	63	3,757
Hurricane Andrew 1992	82%	26	
Three Mile Island Accident 1979	76%	0	
Srebrenica Massacre 1995	76%	8,000+	
Northridge Earthquake 1994	70%	72	8,700
Hurricane Camille 1969	59%	259	
Hurricane Mitch 1998	59%	19,325	
Great Hanshin/Kobe Earthquake 1995	59%	6,434	
Valdivia Earthquake 1960	53%	3,000-6,000	
SOCIAL MEDIA AGE (1999 - 2010)	**% of Quant Metric**	**# of Deaths**	**# of Injured**
September 11 Attacks 2001	100%	2,995	6,000+
London Tube Bombings 2005	100%	56	700
Hurricane Katrina 2005	100%	1,836	
Kashmir Earthquake 2005	100%	79,000	106,000
Virginia Tech Shooting 2007	100%	33	25
Mumbai Terrorist Attacks 2008	100%	175	308
Iranian Elections Protests 2009	100%	36 - 72	
Haiti Earthquake 2010	100%	316,000	300,000
Chile Earthquake 2010	100%	521	
Deepwater Horizon/BP Oil Spill 2010	100%	13	17
Global Warming	100%	*Disputed*	
Climate Change	100%		
Columbine High School Shooting 1999	94%	15	24
Hurricane Ivan 2004	94%	91	
Indian Ocean Tsunami 2004	94%	295,600	125,000
Sichuan Earthquake 2008	94%	68,712	374,643
Pakistan Floods 2010	94%	1,781+	
Madrid Train Bombings 2004	88%	191	2,050
Southern California Wildfires 2007	88%	14	70
Cyclone Nargis 2008	88%	138,366	
Black Saturday Victorian Bushfires 2009	88%	173	414
Russian Wildfires 2010	71%	54	5,000+
Niger Food Crisis 2005-2006	53%		3,300,000
Greek Forest Fires 2007	53%	84	

Table 7: The 39 Crisis Events with a High Social Media Presence

Note: Natural Hazards are Green, Technological Hazards are Blue, Social Hazards are Red
Second Column indicates the Percentage of the Number of Times Each Crisis Appears Across All 17 Metrics
The Third and Fourth Column Provide Death Toll and Number of Injured as One Baseline Indicator

The social media age crisis events that have a higher presence are primarily social hazards and natural hazards. The 2001 September 11 attacks, the 2005 London Tube bombings, the 2007 Virginia Tech school shooting, the 2008 Mumbai attacks, and the 2009 Iranian elections protests are social hazards with the highest social media presence, while the 1999 Columbine High School shooting also exhibits a high presence. The 2005 Hurricane Katrina, the 2005 Kashmir earthquake, the 2010 Haiti earthquake, and the 2010 Chile earthquake are the natural hazards with the highest social media presence. Also, the recent 2010 BP oil spill is the only social media age technological hazard with a high presence. **The trends in the data here suggest that social and natural hazards that occurred during the social media age tend to have a higher social media presence.** The analysis here does not seem to show the same trend found in the pre-social media age either because they are not there or I did not sample well enough, since only two technological hazards that occurred during the social media age were selected**.** This provides an indication that catastrophic natural hazards are gaining more of a presence in the social media landscape, especially those outside of the U.S. The natural hazards that occurred during the pre-social media age and had a high presence tended to be U.S. disasters and thus English-based.

Table 7 also includes the number of deaths and injured for each of the 39 crisis events as one point of comparison. Although one might predict that high death tolls lead to a higher social media presence, the data shows that this is not always the case and sometimes the reverse. For example, the Chernobyl disaster exhibits the highest social media presence for a technological hazard; however, the Bhopal gas leak resulted in a much higher death toll but has a lower social media presence in comparison to the Chernobyl disaster. Similarly, Hurricane Andrew, which killed 26 people, has a higher social media presence than Hurricane Mitch, which killed over

19,000 people. **These findings suggest that a high number of casualties is not a significant indicator for finding crisis events that have a high social media presence.** Therefore, multivariate analysis needs to be conducted to better understand how the characteristics of a crisis event correlate with its social media presence.

The next sections in this chapter discuss the social media presence for crisis events within specific social media services. I present findings from both the quantitative and qualitative social media metrics within Wikipedia, Facebook, Flickr, YouTube, the blogosphere, Twitter, and open digital archives—each of which are discussed separately in the next seven sections. In each section, I enumerate the crisis events that have a high presence within that social media service based on its quantitative metrics (i.e., number of social media artifacts and types of crises and hazards with the most recent post). Then, I present the type of social media content that emerged from analyzing the qualitative metrics (i.e., the type of social media content in most recent or most viewed posts). These findings provide an overview of how social media are used to commemorate historic crises that occurred before the age of social media. Some of the findings from crises that happened more recently during the social media age provide indications of real-time documentation. **The claim I make in showing the following findings specific to each social media service is that the ongoing social media activity for past crisis events as well as the real-time documentation of recent crisis events suggests that social media are facilitating the living heritage of crises.**

6.3 Presence in Wikipedia

To determine which of the 71 pre-social media crisis events exhibited a high presence within Wikipedia, I examined four types of data. The first type is an examination of the pre-social media crisis events that were ranked high based on their quantitative metrics (i.e., number edits, editors, etc.) in Wikipedia. The second type is a quantitative investigation of what types of pre-social media crises had a recent edit (between May 2010 and August 2010) in their Wikipedia article. The third type is a qualitative investigation of the type of recent edits that appeared in all the crisis-related Wikipedia articles. The fourth type is an examination of which crisis events had Wikipedia articles created during the emergency period of the crisis.

6.3.1 Quantitative Wikipedia Metrics

Table 8 displays the number of edits, number of editors, number of watchers, and number of edits per day for the pre-social media crisis events that appeared in the Top 50 of these metrics and sorts the events according to the number of edits. **The Wikipedia data suggests that technological and social hazards occurring before the social media age tend to show a higher presence**, the same finding that appears in Table 7. The same technological and social hazard events that appear in Table 7 also exhibit a high presence in Wikipedia with the addition of the **1968 My Lai massacre**, the **1966 University of Texas massacre**, and the **1989 École Polytechnique massacre**. The same natural hazard events that appear in Table 7 also exhibit a high presence in Wikipedia with the addition of the **1964 Great Alaskan earthquake**.

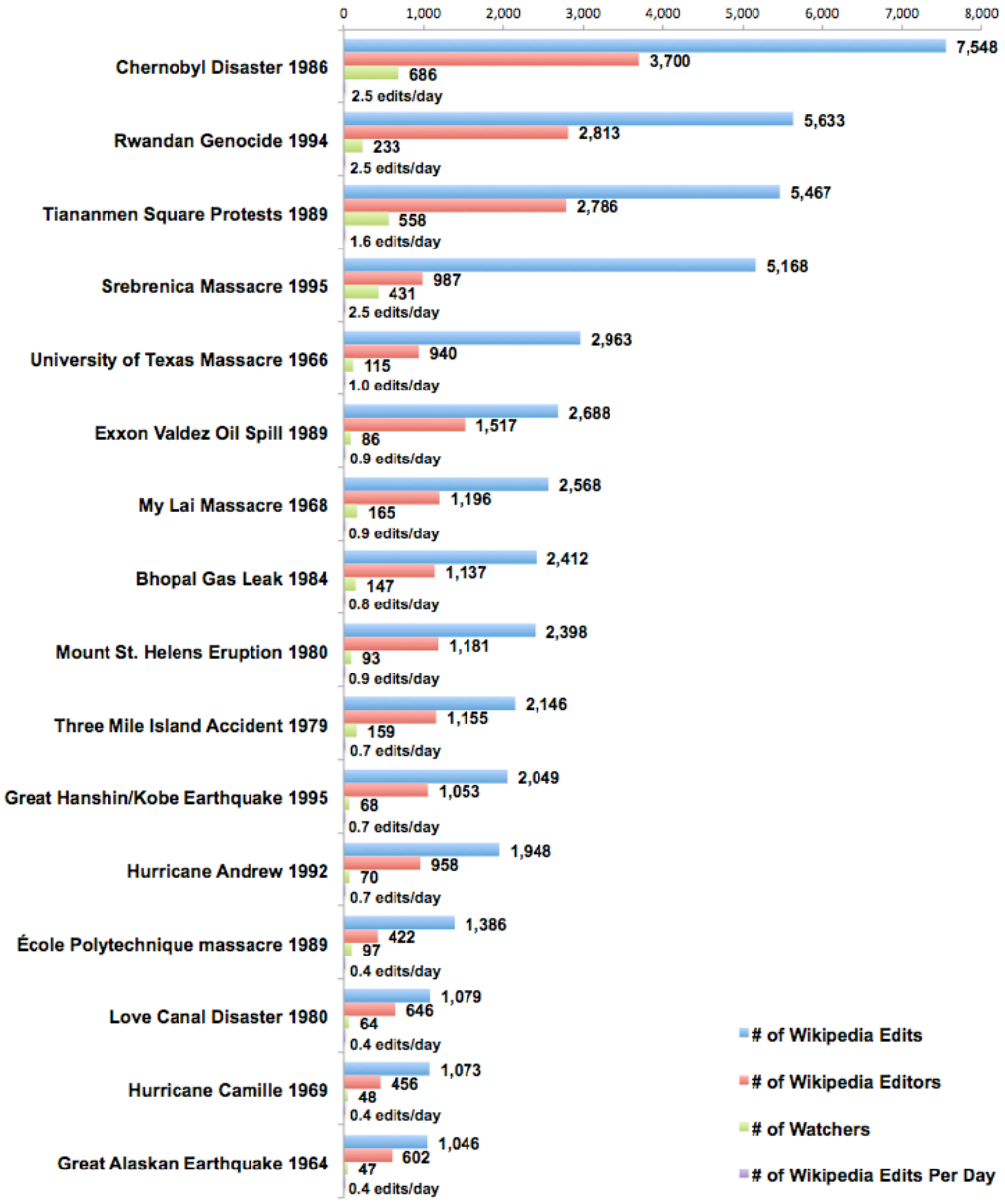

Table 8: Quantitative Wikipedia Metrics (Data Collection Period: June to August 2010)

Most of the pre-social media crisis events contain number of edits in the 2,000 range and number of editors in the 1,000 range. For these 16 pre-social media crisis events, the average number of edits is 2,973 and the average number of editors is 1,347. For all 111 crisis events, the average number of edits is 1,838 and the average number of editors is 718. The average number

of watchers—which are Wikipedia users that choose to have a particular article in their "watchlist" to monitor the edits—is 192 for the 16 pre-social media crisis events with some crisis events like the Chernobyl disaster containing 686 watchers; however, 36 pre-social media crisis events and 53 of the 111 crisis events had less than 30 watchers for their associated Wikipedia articles and were thus marked as zero to determine the average number of watchers. The average number of edits per day is 1.1 for the 16 pre-social media crisis events, and the average number of edits per day is 2.1 for the 111 crisis events. These findings from the quantitative metrics within Wikipedia provide a numerical average of what it means to have a presence in Wikipedia for events that occurred before the age of social media and for the past 50 years. Next, I discuss the types of crises that exhibited recent activity within Wikipedia.

6.3.2 Recent Activity in Wikipedia

I define recent activity in Wikipedia as Wikipedia edits that occurred between May 2010 and August 2010 within each of the 71 pre-social media crisis events. These are edits that occurred during the data collection period (June – August 201) as well as one month prior to this. Listing the crisis events that contained a recent edit for their associated Wikipedia article during this time period did not seem to provide any compelling findings. Therefore, I decided to display these findings according to the type of crises and hazards that exhibited recent activity in Wikipedia, as shown in Table 9, to see if there are any correlations between recent Wikipedia edits and type of hazard.

Type of Hazard	Type of Crisis	Total Number of Crisis Events [By Type of Crisis]	[By Type of Hazard and Age]
Natural Hazards	Earthquakes	9 of 20 (45%)	**25 of 40 (62.5%) Pre-Social Media** 22 of 36 (61.1%) Pre-Web Age 3 of 4 (75%) Web Age
	Hurricanes	9 of 10 (90%)	
	Wildfires	2 of 3 (66.6%)	
	Blizzards	1 of 2 (50%)	
	Tornadoes	1 of 2 (50%)	
	Volcanoes	2 of 2 (100%)	
	Drought	1 of 1 (100%)	
Social Hazards	Famine	3 of 5 (60%)	**17 of 21 (80.9%) Pre-Social Media** 11 of 15 (73.3%) Pre-Web Age 5 of 6 (83.3%) Web Age
	Massacres	7 of 8 (87.5%)	
	School Shootings	2 of 3 (66.6%)	
	Political Protests	4 of 4 (100%)	
	Terrorist Attacks	1 of 1 (100%)	
Technological Hazards	Chemical Leaks	5 of 5 (100%)	**9 of 10 (90%) Pre-Social Media** 9 of 10 (90%) Pre-Web Age 0 of 0 (0%) Web Age
	Oil Spills	2 of 2 (100%)	
	Explosions	1 of 1 (100%)	
	Structural Failure	1 of 2 (50%)	
Total # of Pre-Social Media Crisis Events with Recent Wikipedia Edit: 51 of 71 (71.8%)			

Table 9: Pre-Social Media Crisis Events with Recent Wikipedia Edits

Approximately 72% or 51 of the 71 pre-social media crisis events exhibited recent activity in Wikipedia based on recent edits to the crisis events' Wikipedia articles. Approximately 63% or 25 of the 40 pre-social media natural hazard events contained a recent edit. Approximately 81% or 17 of the 21 pre-social media social hazard events contained a recent edit. Lastly, 90% or 9 of the 10 pre-social media technological hazard events contained a recent Wikipedia edit. The percentages indicate that of all the 40 pre-social media crisis events that are natural hazards, for example, only 63% had a recent edit in their Wikipedia articles. This is partly because some of these historic crisis events have very short Wikipedia articles that are not frequently edited and monitored. However, the number of natural hazard events that exhibited recent activity is higher than social and technological hazard events. One reason for this is

because 40 natural hazard events were selected for this study that occurred in the pre-social media age, whereas only 21 social hazards and 10 technological hazards were selected. Although the sample may not be representative enough or sampled well, **these findings indicate that social and technological hazard events tend to be more frequently edited in Wikipedia than natural hazard events**. Moreover, what Table 9 indicates is that nearly 72% of the pre-social media crisis events selected in this study maintained a high presence in Wikipedia, which indicates that **Wikipedia is frequently used to sustain the living heritage of past crisis events**.

6.3.3 Type of Recent Wikipedia Edit

In addition to finding the number and type of pre-social media crisis events that showed recent activity in their Wikipedia articles, I also examined the recent Wikipedia edits to all 111 crisis events I selected for this study. To do this, I used the "watchlist" feature in Wikipedia to monitor and more easily determine what types of new edits were being made to these articles. The only types of edit that is explicitly identified in Wikipedia's "watchlist" interface are minor edits, bot edits, and new pages. Wikipedia leaves it up to the editors to provide a more detailed description of what type of edit they have made to an article. According to Wikipedia, the following is a list of what should be considered a minor edit: spelling and grammatical corrections, simple formatting (e.g., capitalization, punctuation, etc.), formatting that does not change the meaning of the page or is not contentious, obvious factual errors, fixing layout errors, adding or correcting links to other Wikipedia articles, fixing broken references already present in the article, and removing vandalism or graffiti. However, Wikipedia does not consider the following as a minor edit: creating a new article, adding or removing content in an article, adding or removing tags or other templates in an article, adding or removing references or external links in an article, and adding comments to a talk page.

In reviewing the most recent edits that appeared in "my watchlist" in Wikipedia (which only shows articles that had a recent edit as far back as one month), many of them were considered minor edits. Quite a few of them were **edits by bots** that automatically found and fixed spelling errors or dead links, for example. In some ways, these bot edits help to automatically monitor these articles to correct superficial edits to allow human editors to focus on more substantial edits, but Wikipedia bots could also be created for malicious purposes too. Some of the other edits that occurred in these crisis-specific Wikipedia articles are those that **removed content that was indirectly related to the event, incorrect, dubious, un-sourced, or superfluous**. Many edits removed content due to vandalism, and bots were used to quickly detect this. However, **human editors were needed to detect point of view (POV) edits, which were removed to maintain Wikipedia's neutral point of view (NPOV) policy.**

The more interesting findings emerged when I found recent edits that reworded content or edits that updated the article. Edits that reworded content sometimes led to changes in the meaning of the text. The following is an example of a recent edit for the *Love Canal* Wikipedia article with the rewording in bold text:

> *Before: In that year the Albert Elia Building Co., Inc., now Sevenson Environmental Services, Inc., was selected as the principal contractor* ***for cleanup work*** *at the Love Canal Site.*
>
> *After: In that year the Albert Elia Building Co., Inc., now Sevenson Environmental Services, Inc., was selected as the principal contractor* ***to safely re-bury the toxic waste*** *at the Love Canal Site.*

This rewording leads to a different interpretation of the work Albert Elia Building Co., Inc. actually did, since the actions associated with "cleanup work" convey a broader set of meanings than the action of "safely re-bury[ing] the toxic waste." **The type of content that was updated for a pre-social media crisis event often consisted of mentioning a current event related to**

the crisis. For example, the *Bhopal disaster* Wikipedia article was updated by adding information about the recent 2010 civil and criminal court cases that occurred in June 2010.

Another finding that emerged after examining the "Revision History Statistics" within each Wikipedia article was noticing the year that showed the highest amount of edits. For most pre-social media crisis events, the Wikipedia article tended to have a higher amount of edits between 2005 and 2008. This might be an indication that a higher amount of attention to editing Wikipedia articles particularly those pertaining to crisis events occurred at this time period. Figure 16 provides a similar indication that an exponential increase in number of Wikipedia articles became more noticeable in 2006.

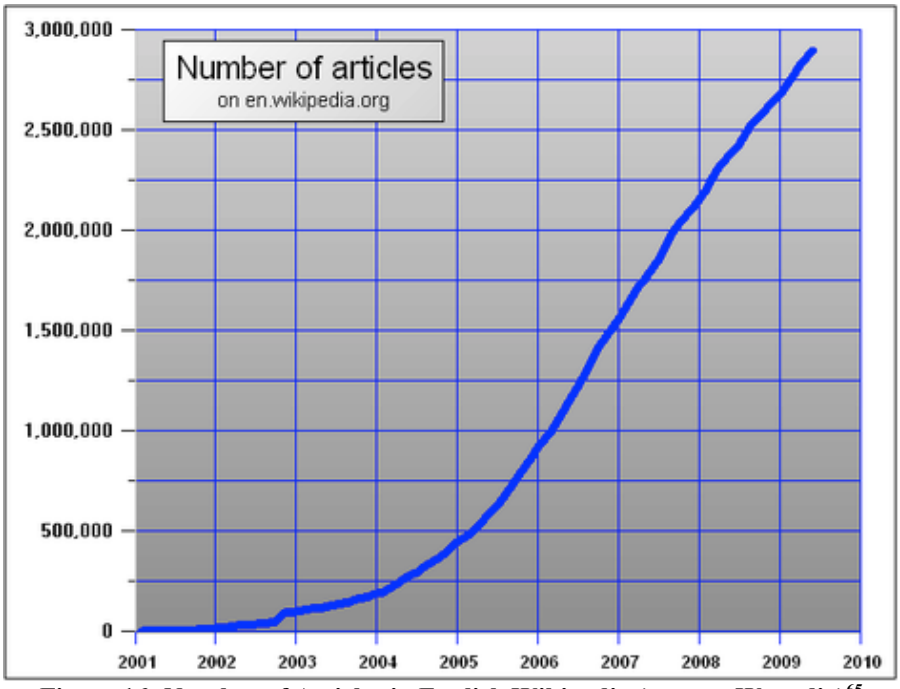

Figure 16: Number of Articles in English Wikipedia (source: Wapedia)[65]

For some events, more edits occurred during the same year as a related crisis event. For example, the eruption of the 1985 Nevado del Ruiz volcano known as the Armero tragedy received a high number of edits in July, August, and September of 2010. I speculate that the

[65] http://wapedia.mobi/en/Wikipedia:Modelling_Wikipedia's_growth

April 2010 eruptions of Eyjafjallajökull in Iceland may have prompted Wikipedia editors to revisit and edit the *Armero tragedy* Wikipedia article. For many of the social media age crisis events, their Wikipedia articles tended to have more edits during the same year in which the crisis occurred. One might expect this and the next section enumerates which Wikipedia articles were created during the crisis event itself.

In summary, there is a broad spectrum of edits that occur in Wikipedia. Based on these findings of recent edits in crisis-related Wikipedia articles, I would argue that Wikipedia editors have the ability to rewrite history by treating Wikipedia articles as living records of past crises. In some instances, Wikipedia articles depict the multidimensionality of a disaster to reflect the complex social process of the crisis that may not be evident in traditional encyclopedic articles.

6.3.4 Real-Time Documentation in Wikipedia Articles: A Living Record

My previous exploratory investigations seemed to show a trend in the creation of Wikipedia articles being created the same day the crisis happened. Here, I was interested in which crisis events had Wikipedia articles created during the crisis event itself. Therefore, this section focuses on crisis events that occurred after Wikipedia was launched in January 15, 2001. There are 34 crisis events in my study that occurred after this date. **The main analytic finding is that approximately 73.5% or 25 of the 34 crisis events had Wikipedia articles created during their emergency period.**

Table 10 presents the 25 crisis events and specifies when their Wikipedia articles were created as well as when they were created during the emergency period. Earthquake articles were created on the same day. Articles on hurricanes/cyclones and winter storms were created during the warning period, while the hurricane made landfall in certain locations, or immediately after it made landfall. Articles on wildfires/bushfires, floods, bombings, massacres, school shootings,

political protests, and the recent BP oil spill were created during the first few days of the emergency. Articles pertaining to the three food crises between 2005 and 2006 were created during this slow onset disaster. Although it is difficult to determine the motivation of the Wikipedia editors who first created these food crisis articles, I speculate that it was due to the international attention to these crises by organizations like the United Nations, UNICEF, and news organizations like the BBC (see Table 10 for details).

The crisis events that did not have a Wikipedia article created during the emergency period tended to be events that occurred outside of the U.S. and may have not received international attention at the time of these emergences. The following is a list of the 9 crisis events with a description of when its Wikipedia article was created:

- 2001 Gujarat earthquake in India on 1/26/2001: Wikipedia article created 10/1/2004
- 2001 September 11 attacks in US: Created on 2/2/2002
- 2002 Erfurt massacre in Germany on 4/26/2002: Created on 6/26/2002
- 2003 Canberra bushfires in Australia on 1/18/2003: Created on 10/29/2004
- 2003 Okanagan Mountain Park fire in Canada on 8/16/2003: Created on 6/27/2005
- 2003 Cedar Fire in US on 10/25/2003: Created on 9/23/2004
- 2003 Bam earthquake in Iran on 12/26/2003: Created on 5/14/2008
- 2005 Texas City Refinery explosion in US on 3/23/2005: Created on 6/28/2005
- 2008 Afghanistan blizzard in February 2008: Created on 3/14/2008

What these findings show is that it was only until the 2004 Madrid Train bombings, approximately three years after Wikipedia was launched, that Wikipedia users began to create crisis event articles while the crisis was still happening. Since 2004, only the Texas City Refinery explosion and the Afghanistan blizzard were created not too long after the event itself.

Crisis Event	Wikipedia Article Creation Date (Month/Day/Year)
2004 Madrid Train Bombings	Day of bombing: 3/11/2004
2004 Beslan School Massacre	During massacre: 9/2/2004 (9/1 – 9/3)
2004 Hurricane Ivan	During the hurricane: 9/6/2004 (9/2 – 9/24)
2004 Indian Ocean Earthquake/Tsunami	Day of earthquake & tsunami: 12/26/2004
2005 Andijan Massacre	Day of massacre: 5/13/2005
2005 London Tube Bombings	Day of bombing: 7/7/2005
2005 Hurricane Katrina	Before hurricane made landfall: 8/26/2005 (8/23 – 8/30)
2005 Kashmir Earthquake	Day of earthquake: 10/8/2005
2005 Malawi Food Crisis	Middle of food crisis: 10/8/2005 (UN appealed US in Aug)
2005-2006 Niger Food Crisis	Middle of food crisis: 7/25/2005 (BBC/UNICEF articles in July)
2006 Horn of Africa Food Crisis	Middle of food crisis: 1/10/2006 (UN report posted on Jan 6)
2007 Virginia Tech Shooting	Day of shooting: 4/16/2007
2007 Greek Forest Fires	Middle of wildfires: 8/25/2007 (6/28 – 9/3)
2007 Southern California Wildfires	Beginning of wildfires: 10/22/2007 (10/20 – 11/9)
2008 Chinese Winter Storms	During storms: 1/31/2008 (1/25 – 2/6)
2008 Cyclone Nargis	After cyclone made landfall: 5/3/2008 (4/27 – 5/3)
2008 Sichuan Earthquake	Day of earthquake: 5/12/2008
2008 Mumbai Terrorist Attacks	First day of attacks: 11/26/2008 (11/26 – 11/29)
2009 Black Saturday Victorian Bushfires	Beginning of bushfires: 2/7/2009 (2/7 – 3/14)
2009 Iranian Elections Protests	Beginning of protests: 6/14/2009 (6/13 – ongoing)
2010 Haiti Earthquake	Day of earthquake: 1/12/2010
2010 Chile Earthquake	Day of earthquake: 2/27/2010
2010 Deepwater Horizon / BP Oil Spill	Beginning of oil spill: 4/21/2010 (4/20 – 7/15)
2010 Russian Wildfires	Beginning of wildfires: 8/1/2010 (7/29 – 9/2)
2010 Pakistan Floods	During floods: 7/30/2010 (7/26 – ongoing)
25 of 34 (73.5%) Crisis Events that have Wikipedia Articles Created During Crisis	

Table 10: Social Media Age Crisis Events that have Wikipedia Articles Created During Crisis

6.4 Presence in Facebook

To determine which pre-social media crisis events exhibited a high presence within Facebook, I examined three types of data. The first type is an examination of the pre-social media crisis events that were ranked high based on their quantitative metrics (i.e., number Facebook groups, pages, and causes). The second type is a quantitative investigation of what

types of pre-social media crises had a recent post (between May 2010 and August 2010) in a Facebook group. The third type is a qualitative investigation of the type of recent posts that appeared in all the crisis-related Facebook groups.

6.4.1 Quantitative Facebook Metrics

Table 11 displays the number of Facebook groups, pages, and causes for the pre-social media crisis events that appeared in the Top 50 of these metrics and sorts the events according to the total number of these three metrics. For the 19 pre-social media crisis events in Table 11, the average number of Facebook groups is 76, the average number of Facebook pages is 21, and the average number of Facebook causes is 7. For all 111 crisis events, the average number of Facebook groups is 77, the average number of Facebook pages is 110, and the average number of Facebook causes is 36. These findings from the quantitative metrics within Facebook provide a numerical average of what it means to have a high presence in Facebook for events that occurred before the age of social media.

Technological hazards that occurred before the social media age tended to have the highest presence in Facebook with social hazards having the second highest presence. The pre-social media crisis events that had the highest presence in Facebook are the same four technological hazards (i.e., the Chernobyl disaster, Three Mile Island accident, the Bhopal gas leak, and the Exxon Valdez oil spill). Some of the same social and natural hazard events that appear in Table 7 also exhibit a high presence in Facebook with the addition of the 1988 8888 Uprising in Burma, the 1992 Somalia famine, the 1966 University of Texas massacre, the 1996 North Korean famine, the 1992 Khojaly massacre, the 1983 Ash Wednesday bushfires, and the 1988 executions of Iranian political prisoners. The Rwandan genocide had the most number of Facebook groups while the Chernobyl disaster had the most number of Facebook pages and

causes. The Chernobyl disaster, the Rwandan genocide, and the Bhopal gas leak had a much larger amount of Facebook causes than any other crisis event. The Bhopal gas leak also had the second highest number of Facebook pages.

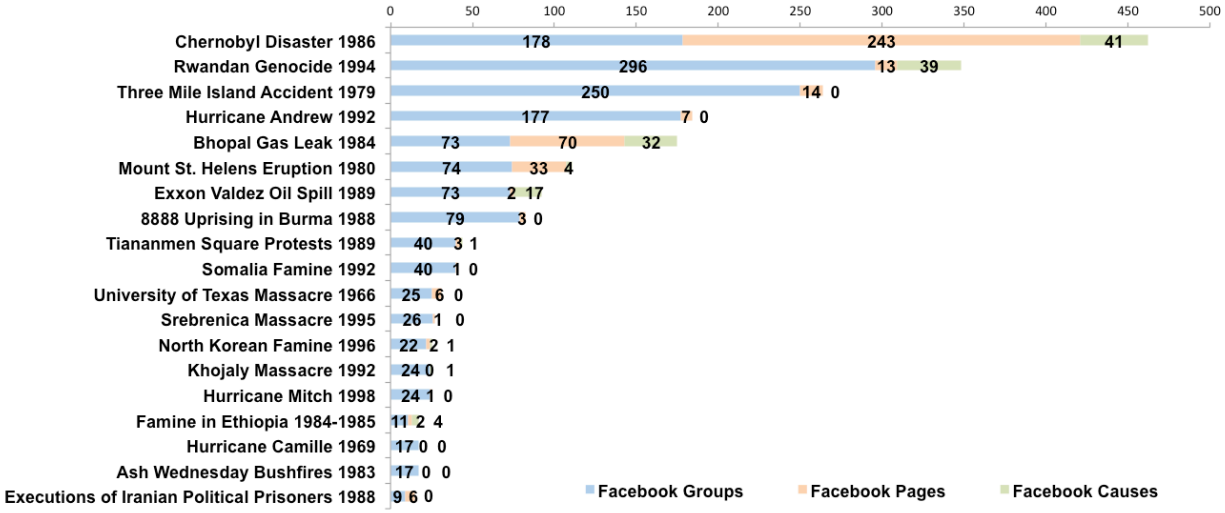

Table 11: Quantitative Facebook Metrics (Data Collection Period: June to August 2010)

Based on these findings, I suspect that Facebook is being used more frequently to spread awareness about the long-term health effects of technological hazards and the atrocities that resulted from social hazards. Facebook activity for natural hazard events that occurred before the social media age have less of a presence and do not have Facebook causes, which tend to be more oriented toward activism, fundraising, and political campaigning. Although many of the Facebook groups, pages, and causes probably do not have a large number of members or a high amount of activity, it is the act of just creating these Facebook artifacts that shows an attempt to get others on Facebook to commemorate these crises. In some ways, the creators of these artifacts are trying to bring these crises to an open place like Facebook where someone else has the opportunity to occasion it or discover it. The next section discusses the type of crisis events that exhibited recent activity in Facebook.

6.4.2 *Recent Activity in Facebook*

As I previously mentioned, I define recent activity for this study as wall posts in a Facebook group that occurred between May 2010 and August 2010. Table 12 presents the type of hazards and crises that contained a recent Facebook wall post in a crisis-related Facebook group that had a large number of members. Approximately 41% or 29 of the 71 pre-social media crisis events exhibited recent activity in Facebook. Approximately 30% or 12 of the 40 pre-social media natural hazard events contained a recent post. Approximately 43% or 9 of the 21 pre-social media social hazard events contained a recent post. Lastly, 80% or 8 of the 10 pre-social media technological hazard events contained a recent Facebook post.

Type of Hazard	Type of Crisis	Number of Events [By Type of Crisis]	[By Type of Hazard and Age]
Natural Hazards	Earthquakes	7 of 20 (35%)	**12 of 40 (30%) Pre-Social Media** 10 of 36 (27.7%) Pre-Web Age 2 of 4 (50%) Web Age
	Hurricanes	3 of 10 (30%)	
	Wildfires	2 of 3 (66.6%)	
	Blizzards	0 of 2 (0%)	
	Tornadoes	0 of 2 (0%)	
	Volcanoes	0 of 2 (0%)	
	Drought	0 of 1 (0%)	
Social Hazards	Famine	0 of 5 (0%)	**9 of 21 (42.8%) Pre-Social Media** 7 of 15 (46.6%) Pre-Web Age 2 of 6 (66.6%) Web Age
	Massacres	4 of 8 (50%)	
	School Shootings	3 of 3 (100%)	
	Political Protests	1 of 4 (25%)	
	Terrorist Attacks	1 of 1 (100%)	
Technological Hazards	Chemical Leaks	4 of 5 (80%)	**8 of 10 (80%) Pre-Social Media** 8 of 10 (80%) Pre-Web Age 0 of 0 (0%) Web Age
	Oil Spills	2 of 2 (100%)	
	Explosions	1 of 1 (100%)	
	Structural Failure	1 of 2 (50%)	
Total # of Pre-Social Media Crisis Events with Recent Facebook Post: 29 of 71 (40.8%)			

Table 12: Pre-Social Media Crisis Events with Recent Facebook Posts

Since the number of crisis events for each type of hazard are not equivalent, it is difficult to make any broad claims. Although the percentage of technological hazard events is higher, there were not enough technological hazards to make claims that it tends to be more frequently

commemorated in Facebook. Instead, there are indications that certain types of technological crises (i.e., chemical leaks and oil spills) may be commemorated more frequently. Similarly, within the natural hazards category, earthquakes, hurricanes, and wildfires were commemorated more frequently, and within the social hazards category, massacres and school shooting were also commemorated more frequently.

6.4.3 Type of Recent Facebook Post

During the survey study, links to recent activity in a Facebook group were documented and examined. I coded and categorized the recent posts and found the following five types that emerged in most of the crisis-related Facebook groups I examined: Facebook posts oriented towards 1) **reminiscence**, 2) **memorializing**, 3) **reflection of the impacts**, 4) **preparedness**, and 5) **activism**. It is worth noting that some of the most recent Facebook posts were spam, which frequently occurred in Facebook groups that did not have a high amount of activity.

6.4.3.1 Reminiscence

One might expect that Facebook posts of past crisis events would contain reminiscence, since many of these events occurred as far back as 50 years ago. Some posts were survivor stories of what the Facebook user experienced on the day of the crisis, where s/he was, and how old s/he was (with many of them being young children or teenagers at the time of the crisis). For example, the following post appears in the *I Survived Hurricane Camille* Facebook group:

> *"I was six years old and it was an event I will never forget. We were not close to the Gulf coast. We were 45 minutes south of Jackson, Mississippi and 45 minutes north of Hattiesburg. I remember the china cabinet was shaking and the bone china was rattling…" [sic]*

Other posts contained stories about why the crisis was significant to them, specific details of the physical impact the crisis had on particular locations in their neighborhood, and experiences revealing how life was disrupted by not being able to do the everyday, inconsequential activities.

6.4.3.2 Memorializing

Posts pertaining to memorial activities are also to be expected for reviving past crises. This typically occurred in the form of paying tribute to the victims who died as a result of the crisis event by posting their name or uploading a photo of them, which was a way of placing an identity to the number of deaths often associated with the crisis event. Some posts requested other Facebook users to change their profile photo to a commemorative logo or image as an indication of support and solidarity visible to one's online social networks.

6.4.3.3 Reflection of the Impacts

Recent posts also contained reflections on the impacts of the crisis. Facebook users mentioned specific short- and long-term effects that emerged in the aftermath of the crisis and how the crisis led to current life situations. Anniversary dates of past crises tend to provoke retrospection. The following post that appears on the wall of the *Chernobyl* Facebook group not only describes some of the long-term effects of the Chernobyl disaster but also offers a more proactive way of viewing anniversaries:

> *"24 years, and the world is mostly ignorant about what happened and what are the implications on nuclear power. It's unfortunate the Ucranian government is not willing to share more information about the tragedy and looks like they're not really concerned with the families that survived, but lost their homes and work, and now live in adverse conditions. All the ones that worked to stop the tragedy are, for me, some of mankind's true heroes — I'm remembering the 'liquidators' now. To the governments planning to use nuclear power, may this date be remembered as an alert. May it be a wake-up call for all of us." [sic]*

Beyond just reflecting on the impacts of the Chernobyl disaster, his post also reminds people of the unsung heroes that helped to mitigate the effects of the nuclear accident while urging people to use the anniversary date as an opportunity to educate people about the deeper cause of the crisis, in this case "the implications of nuclear power," and how to prevent a tragedy like this from happening in the future.

6.4.3.4 Preparedness

The fourth type of content that appeared in recent Facebook posts was information about preparedness. In the following excerpt, a Facebook user shared information regarding new ways to receive disaster alerts for natural hazard events earlier than what was previously experienced for past historic crises. The following is an example of this type of post:

> *"We think getting a message out about Bush Fires early is important! Well Bush Fire Alert have done just that. Receive an early warning, Phone Call, SMS, and Email in the event of a Bush Fire in the very early stages. To find out more go to http://www.facebook.com/bushfirealert..."*

This post appeared in the *Support Our Victorian Bushfire Victims* Facebook group. In similar posts, Facebook users encouraged people to purchase preparedness kits and review evacuation protocols in their neighborhoods.

6.4.3.5 Activism

The fifth type of content that appeared in Facebook was about activism. Facebook users posted requests asking people to vote for a particular candidate that pledged to help with the long-term effects of that crisis event, sign petitions, attend protests, and advocate for justice to those adversely affected by the crisis. For example, the following post appears in the *I survived the Three Mile Island Nuclear Generating Site accident* Facebook group:

> *"Hi all anti-nuclear supporters! Please take one moment to vote for Karolina who has donated herself to the Chernobyl Children's Project this year and is so close to winning this for Chernobyl! Please vote here for Karolina + Chernobyl Children's Project International: http://apps.facebook.com/vote-wod/…Grateful if you could send on link to all your friends…"*

One trend evident in this post is how people tend to link together related crisis events to help raise awareness across multiple crisis events. Moreover, these requests from activists tended to occur in Facebook groups pertaining to technological and social hazards. These types of hazards

are often require human intervention to make them preventable, to mitigate the impacts of these hazards, and to strengthen society's resilience to these hazards.

The Facebook posts pertaining to reminiscence, memorializing, and reflection tended to facilitate retrospective accounts, whereas, posts pertaining to preparedness and activism tended to facilitate prospective engagement to promote social action. In some ways, Facebook groups, pages, and causes are becoming virtual sites to connect people with similar past experiences and similar aspirations for the future.

6.5 Presence in Flickr

To determine which pre-social media crisis events exhibited a high presence within Flickr, I examined three types of data. The first type is an examination of the pre-social media crisis events that were ranked high based on their quantitative metrics (i.e., number Flickr photos and Flickr groups). The second type is a quantitative investigation of what types of pre-social media crises had a recent Flickr post (May 2010 and August 2010). The third type is a qualitative investigation of the type of photos uploaded to Flickr pertaining to all 111 crisis events.

6.5.1 Quantitative Flickr Metrics

Table 13 displays the number of Flickr photos and groups for the pre-social media crisis events that appeared in the Top 50 of these two metrics and sorts the events according to the number of photos. For the 23 pre-social media crisis events in Table 13, the average number of Flickr photos is 750 and the average number of Flickr groups is 3. For all 111 crisis events, the average number of Flickr photos is 4,155 and the average number of Flickr groups is 15. These findings from the quantitative metrics within Flickr provide a numerical average of what it means to have a high presence in Flickr for events that occurred before the age of social media as well as across all 111 crisis events selected for this study.

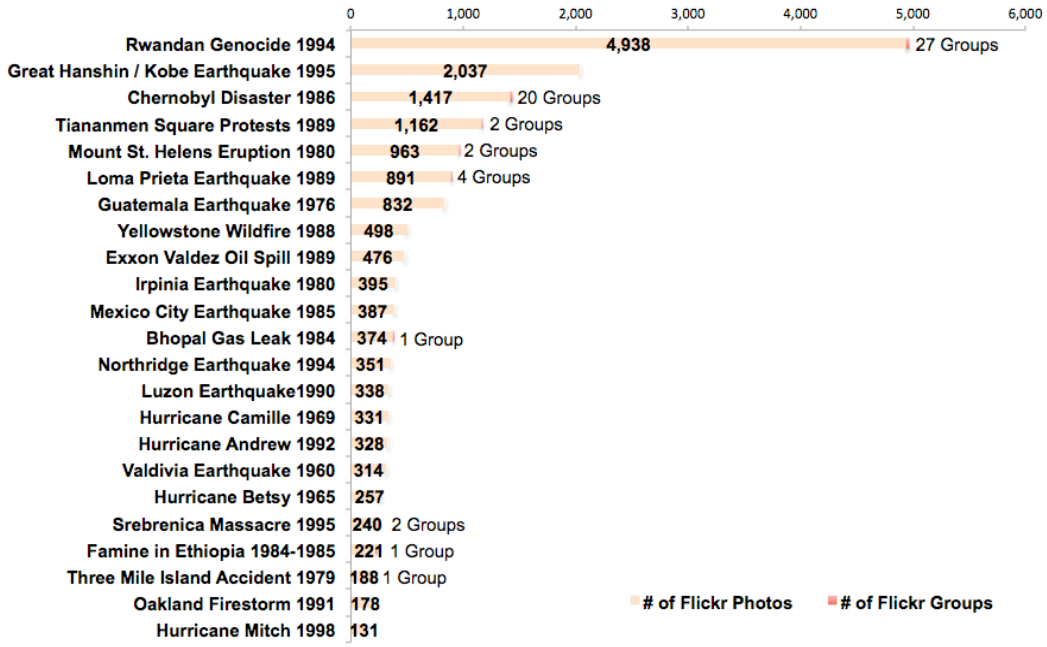

Table 13: Quantitative Flickr Metrics (Data Collection Period: June to August 2010)

The pre-social media crisis events that exhibited a high presence in Flickr involved some of the same crisis events but with the addition of more natural hazard events. The same technological, social, and natural hazard events that appear in Table 1 also exhibit a high presence in Flickr with the addition of the **1995 Great Hanshin or Kobe earthquake**, the **1976 Guatemala earthquake**, the **1988 Yellowstone wildfire**, the **1980 Irpinia earthquake**, the **1985 Mexico City earthquake**, the **1994 Northridge earthquake**, the **1990 Luzon earthquake**, **1965 Hurricane Betsy**, the **1991 Oakland firestorm**, and the **1984 – 1985 famine in Ethiopia**. The 1994 Rwandan genocide had the most number of Flickr photos and groups, a similar finding that occurred in Facebook, and the Chernobyl disaster had the second highest number of Flickr groups. **Although a few of the technological and social hazard events exhibit higher numbers of Flickr photos and groups, a majority of the crisis events that have a presence in Flickr are natural hazards.** These findings provide an early indication that crises caused by natural hazards more frequently have a high presence in Flickr than in other social media. The next section describes the type of crises that exhibited recent Flickr activity.

6.5.2 *Recent Activity in Flickr*

Table 14 presents the type of hazards and crises that had a photo recently uploaded to Flickr between May and August 2010. Approximately 40% or 28 of the 71 pre-social media crisis events exhibited recent activity in Flickr, similar to the amount in Facebook. Approximately 37% or 15 of the 40 pre-social media natural hazard events contained a recent Flickr photo. Approximately 33% or 7 of the 21 pre-social media social hazard events contained a recent Flickr photo. Lastly, 60% or 6 of the 10 pre-social media technological hazard events contained a recent Flickr photo.

Type of Hazard	Type of Crisis	Number of Events [By Type of Crisis]	[By Type of Hazard and Age]
Natural Hazards	Earthquakes	7 of 20 (35%)	**15 of 40 (37.5%) Pre-Social Media** 12 of 36 (33.3%) Pre-Web Age 3 of 4 (75%) Web Age
	Hurricanes	5 of 10 (50%)	
	Wildfires	1 of 3 (33.3%)	
	Blizzards	0 of 2 (0%)	
	Tornadoes	0 of 2 (0%)	
	Volcanoes	2 of 2 (100%)	
	Drought	0 of 1 (0%)	
Social Hazards	Famine	2 of 5 (40%)	**7 of 21 (33.3%) Pre-Social Media** 4 of 15 (26.6%) Pre-Web Age 3 of 6 (50%) Web Age
	Massacres	3 of 8 (37.5%)	
	School Shootings	1 of 3 (33.3%)	
	Political Protests	1 of 4 (25%)	
	Terrorist Attacks	0 of 1 (0%)	
Technological Hazards	Chemical Leaks	3 of 5 (60%)	**6 of 10 (60%) Pre-Social Media** 6 of 10 (60%) Pre-Web Age 0 of 0 (0%) Web Age
	Oil Spills	2 of 2 (100%)	
	Explosions	1 of 1 (10%)	
	Structural Failure	0 of 2 (0%)	
Total # of Pre-Social Media Crisis Events with Recent Flickr Photo: 28 of 71 (39.4%)			

Table 14: Pre-Social Media Crisis Events with Recent Flickr Photos

Based on the findings in Table 14, photos of earthquakes, hurricanes, wildfires, and volcanoes exhibited more recent activity than blizzards, tornadoes, and droughts. One reason for this is that the physical impact of earthquakes, hurricanes, wildfires, and volcanoes are very

visual and frequently photographed by mainstream media, emergency responders, and affected populations. The impacts of social and technological hazards are not always visible or easily photographable; however, the long-term health and environmental effects of these hazards are photographed and used as visual devices to spread awareness or promote a cause.

6.5.3 Types of Flickr Photos

During the survey study, I also visually examined, coded, and categorized the most recent Flickr photo for all 111 crisis events along with other photos that appeared in the Flickr search results for each crisis. The following four types of photos pertaining to historic crises are typically uploaded to Flickr: Images of 1) the **hazard agent itself and its effects**, 2) **official and scientific reports**, 3) **memorializations**, and 4) the **impact zone in the present day**. Figure 17 is a collage of 72 Flickr photos I examined for this study to provide a visual overview of some of the images that pertain to the 111 crisis events selected for this study.

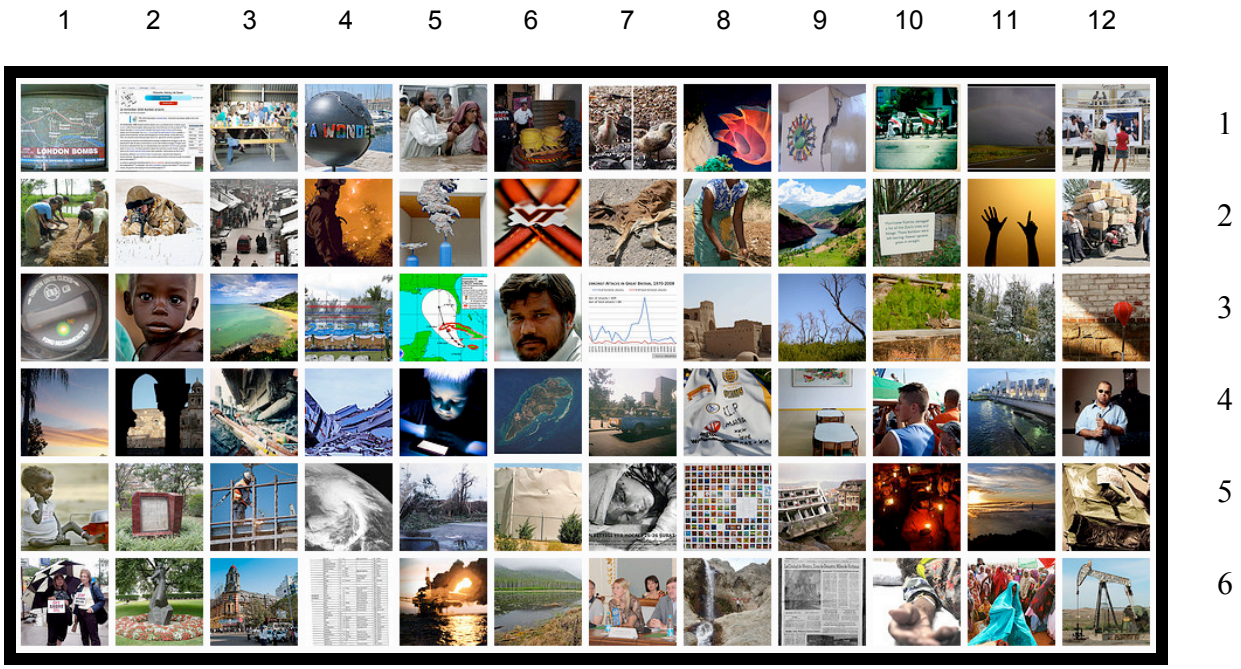

Figure 17: 72 Thumbnails of Flickr Photos Pertaining to Some of the 111 Crisis Events in this Study

6.5.3.1 Hazard Agent and Its Effects

Photos that capture the hazard agent and its physical impact are commonly shared in Flickr. This is not surprising since such images depict what most people tend to remember about a crisis. One finding that emerged was how Flickr users would upload images of the hazard agent to draw attention and then use the caption field to provide additional information that may not be widely known. For example, an image of the 1988 Piper Alpha explosion was uploaded in June 2010 (Figure 17, 5th column, 6th row). This is accompanied by a long caption describing what happened that day, what could have been done, the design of the platform that caused the explosion, and the lack of accountability that resulted. The following is a snippet from this caption detailing this information:

> *"The main problem was that most of the personnel who had the authority to order evacuation had been killed when the first explosion destroyed the control room. This was a consequence of the platform design, including the absence of blast walls. Another contributing factor was that the nearby connected platforms Tartan and Claymore continued to pump gas and oil to Piper Alpha until its pipeline ruptured in the heat in the second explosion. Their operations crews did not believe they had authority to shut off production, even though they could see that Piper Alpha was burning."*

Similarly, the International Federation of Red Cross and Red Crescent Societies uploaded an image of a dried up animal carcass from the 2006 food crisis in the Horn of Africa (Figure 17, 7th column, 2nd row). The following is a snippet of the caption that accompanied this photo:

> *"Soaring food prices and a crippling drought are currently jeopardizing the lives of 20 million people in the Horn of Africa. Many of the affected people are already living on the margins of survival due to conflict, displacement and chronic poverty. Drought is also not a new phenomenon to the region. However, this time external factors like the price of food and fuel on the international markets and the significant fluctuations in the dollar exchange rates threaten to push millions over the edge. This may potentially develop into famine not seen on such a scale for many years."*

In the case of the food crisis in the Horn of Africa, the caption indicates how it was not just a drought, a natural phenomenon, that caused this crisis but other social, political, and economic

factors. Such captions provide an in-depth explanation of the complex causes of these crises. In the case of the Piper Alpha explosion, the information in the caption provides a deeper explanation of how this technological hazard was a result of the design of the technology and problems in organizational communication. Sharing this type of information has the potential to raise awareness about warning signs that can be used to prevent future technological hazards to facilitate disaster mitigation efforts.

6.5.3.2 Official and Scientific Reports

Photos of official reports, such as newspaper headlines, TV news, and scientific reports, were also uploaded to Flickr. For example, images of local newspapers that reported on the 1972 Buffalo Creek flood and the 1985 Mexico City earthquake (Figure 17, 9th column, 6th row) provided an archival image of the original newspaper headline produced immediately after the flood and earthquake. For more recent crisis events, screenshots of TV news reports were uploaded to provide visual news updates during the event itself, which occurred for the London Tube bombings (Figure 17, 1st column, 1st row) and the Virginia Tech school shooting.

Satellite imagery and forecasts of hurricanes, cyclones, and blizzards (Figure 17, 4th column, 5th row; 5th column, 3rd row) also appeared and may appear more frequently in the future, since access to satellite imagery has become more pervasive. Images from scientific reports, such as a graph from the Study of Terrorism and Responses to Terrorism (START) Background Report (Figure 17, 7th column, 3rd row), were also uploaded and accompanied with a long caption containing key findings from the report. The digitization of ephemeral artifacts from an analog medium (e.g., old newspaper headlines and TV news headlines) and the redistribution of information from scientific reports are indications of new ways in which people are preserving crisis-related memories by cross-posting information from different media.

6.5.3.3 Representations of Memorialization

Photos presenting the memorialization of past crises also frequently appeared in Flickr. Many of the images depicted memorials in the physical world and often near the impact of the crisis. People took photos of the following memorialization activities: an exhibition about the 2008 Sichuan earthquake (Figure 17, 12th column, 1st row), a ceremonial march on the anniversary of the 1995 Srebrenica massacre (Figure 17, 10th column, 4th row), and a candlelight vigil on the anniversary of the 1989 École Polytechnique massacre.

Many of the more recent Flickr photos of the 111 crisis events are images of the physical memorial sites for natural hazard events, such as the Hurricane Camille Memorial at the Church of the Redeemer in Biloxi, Mississippi; the Armenian Earthquake Memorial statue at the Red Cross building in Washington D.C. commemorating the 1988 Spitak earthquake (Figure 17, 2nd column, 6th row); the Firestorm Community Mural Project dedicated to those affected by the 1991 Oakland Hills Firestorm at the BART subway station in Oakland, California (Figure 17, 8th column, 5th row); and the Port of Kobe Earthquake Memorial Park commemorating the 1995 Great Hanshin earthquake. Images of physical memorials for social hazards also appeared in Flickr. For example, a photo of the memorial placard at the site of the 1982 Sabra and Shatila massacre in Beirut, Lebanon, and the memorial inside the Canadian embassy grounds in memory of the Rwandan staff of the Canadian Embassy killed by the genocide politics in Rwanda both depict the physical memorials that exist to commemorate these crisis events. There is a common tendency to take photos of memorial sites; yet, further investigations are needed to determine why people share these photos and/or what value there is in sharing such images of physical memorials in social media services like Flickr.

Some of the Flickr photos illustrated artistic and symbolic forms of commemoration. For example, a painting was uploaded to Flickr illustrating the effects of the 1980 Love Canal

disaster by depicting a woman having a miscarriage near the toxic water from the Love Canal. Flickr photos that were symbolic forms of commemoration relied on using the caption to communicate their act of remembrance. For example, one photo symbolically communicated the North Korea famine with a photo of a school canteen in North Korea framed in a way to show clean but empty tables juxtaposed with a painting of fruit hanging on the wall in the background (Figure 17, 9th column, 4th row). In the caption, the photographer writes,

> *"This picture is what north koreans officials want to show from the country: a clean place, with a nice paint of plenty of fruits. Perhaps to make visitors forget that 10% of the population in the area died of starvation few years ago in the north of the country." [sic]*

Some photos were images of a flower with a caption to commemorate the crisis and those who lost their lives on the anniversary of the crisis. Although memorializing often occurs on the anniversary dates of historic crises, the sharing of these images in Flickr makes them publicly available at any time and, in some ways, allows ongoing memorials to take place engendering similar reflections that occur at physical memorials in public places.

6.5.3.4 Impact Zone in the Present Day

Lastly, photos of the impact zone as depicted in the present day were also uploaded to Flickr. These place-based images create a contextual landscape of where the crisis took place and its current spatial surroundings. For example, a sunset photo overlooking the Toutle River is shared in memory of the 1980 Mount St. Helens eruption. Similarly, a sunset image overlooking the Golden Gate Bridge is shared in remembrance of the 1989 Loma Prieta earthquake (Figure 17, 11th column, 5th row).

In contrast to these images capturing a broad spatial view of a location that was previously affected by a natural hazard, another Flickr photo captures a water tanker that was damaged from the 1992 Landers earthquake in California accompanies with a caption explaining

how the water tanker flooded the neighboring homes (Figure 17, 6th column, 5th row). Photos depicting social hazards, such as the 8888 Burma uprising in 1988 and the 1998 United States Embassy terrorist attacks, captured memorable locations, such as the location of a major rallying point (Figure 17, 3rd column, 6th row) and of the US embassy in Nairobi where the attacks took place (Figure 17, 7th column, 4th row) respectively.

What these types of photos indicate is a revival of past crises through the juxtaposition of a present day image depicting the place where a historic crisis occurred with a caption referring to that past crisis. This encourages the viewer to consider familiar surroundings of the present day in light of the effects of past crises and potential future crises that may occur in that place.

6.6 Presence in YouTube

To determine which pre-social media crisis events exhibited a high presence within YouTube, I examined three types of data. The first type is an examination of the pre-social media crisis events that were ranked high based on two quantitative YouTube metrics (i.e., number YouTube videos and YouTube playlists). The second type is a quantitative investigation of what types of pre-social media crises had a recent post (between May 2010 and August 2010) in YouTube. The third type is a qualitative investigation of the most recent and most viewed YouTube videos for all 111 crisis events.

6.6.1 Quantitative YouTube Metrics

Table 15 displays the number of YouTube videos and playlists for the pre-social media crisis events that appeared in the Top 50 of these metrics and sorts the events according to the number of videos. For the 24 pre-social media crisis events in Table 15, the average number of YouTube videos is 459 and the average number of YouTube playlists is 736. YouTube playlists are user-generated lists that allow YouTube users to group together YouTube videos. In this

study, the number of YouTube playlists means the number of lists that contains videos associated with the search terms I chose for each of the crisis events. For all 111 crisis events, the average number of YouTube videos is 7,351 and the average number of YouTube playlists is 4,518. These findings from the quantitative metrics within YouTube provide a numerical average of what it means to have a high presence in YouTube for events that occurred before the age of social media as well as across all 111 crisis events selected for this study.

The pre-social media crisis events that exhibited a high presence in YouTube involved some of the same natural, technological, and social hazard events but with the addition of six other crisis events that did not show a high presence in the other social media services. The six crisis events are the **1990s Algerian village massacres**, the **1992 Sabra and Shatila massacre**, the **1988 Piper Alpha explosion**, the **1998 Sudan famine**, the **1993 Storm of the Century blizzard**, and the **1979 Ixtoc oil spill**. The Chernobyl disaster has the highest number of YouTube videos, but the Tiananmen Square protests has the highest number of playlists and the second highest number of videos. Further research needs to be conducted to better understand why the Tiananmen Square protests have a high presence, but I suspect that the censorship on this crisis in China may have led to an increase in online documentation and sharing of these artifacts. The Algerian village massacres that occurred during the 1990s received the third highest number of YouTube videos, which is a crisis that did not have a high presence in Table 7 or in Wikipedia, Facebook or Flickr. Similarly, there are other social hazard events that have not exhibited a high presence in the previous social media services but do have a presence in YouTube. **Nearly half of the pre-social media crisis events that exhibited a high presence in YouTube are social hazards. These findings suggest that crisis events caused by social**

hazards more frequently appear in YouTube than in other social media services. The next section describes the type of hazards and crises that exhibited recent activity in YouTube.

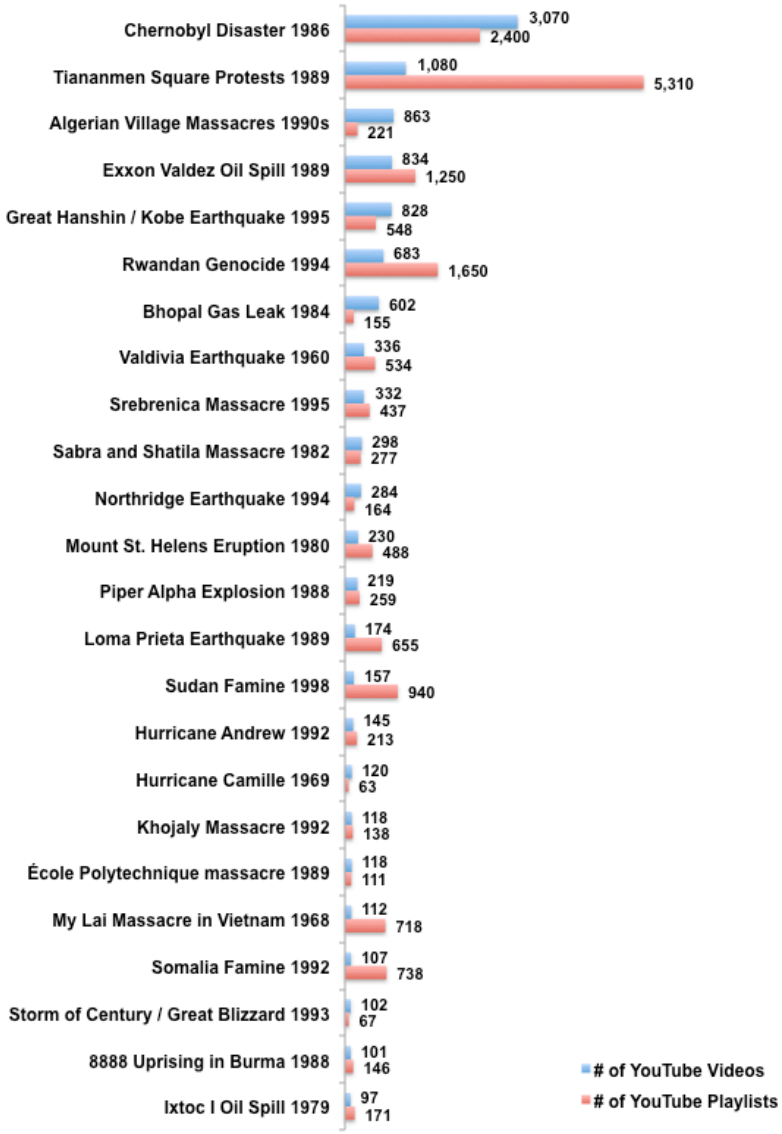

Table 15: Quantitative YouTube Metrics (Data Collection Period: June to August 2010)

6.6.2 Recent Activity in YouTube

Table 16 presents the type of hazards and crises that had a video recently uploaded to YouTube between May and August 2010. Approximately 72% or 51 of the 71 pre-social media crisis events exhibited recent activity in YouTube, which is the same amount for Wikipedia.

Approximately 60% or 24 of the 40 pre-social media natural hazard events contained a recent YouTube video. Approximately 90% or 19 of the 21 pre-social media social hazard events contained a recent YouTube video. This correlates with what was previously mentioned that social hazards that occurred before the age of social media tend to have a more frequent presence in YouTube than other hazards. Lastly, 80% or 8 of the 10 pre-social media technological hazard events contained a recent YouTube video. In the next section, I discuss the type of videos that are uploaded to YouTube across all the crisis events to provide more descriptive findings of how historic crisis events maintain a presence in YouTube.

Type of Hazard	Type of Crisis	Number of Events [By Type of Crisis]	[By Type of Hazard and Age]
Natural Hazards	Earthquakes	13 of 20 (65%)	**24 of 40 (60%) Pre-Social Media** 20 of 36 (55.5%) Pre-Web Age 4 of 4 (100%) Web Age
	Hurricanes	5 of 10 (50%)	
	Wildfires	2 of 3 (66.6%)	
	Blizzards	1 of 2 (50%)	
	Tornadoes	0 of 2 (0%)	
	Volcanoes	2 of 2 (100%)	
	Drought	1 of 1 (100%)	
Social Hazards	Famine	4 of 5 (80%)	**19 of 21 (90.4%) Pre-Social Media** 13 of 15 (86.6%) Pre-Web Age 6 of 6 (100%) Web Age
	Massacres	8 of 8 (100%)	
	School Shootings	3 of 3 (100%)	
	Political Protests	3 of 4 (75%)	
	Terrorist Attacks	1 of 1 (100%)	
Technological Hazards	Chemical Leaks	3 of 5 (60%)	**8 of 10 (80%) Pre-Social Media** 8 of 10 (80%) Pre-Web Age 0 of 0 (0%) Web Age
	Oil Spills	2 of 2 (100%)	
	Explosions	1 of 1 (100%)	
	Structural Failure	2 of 2 (100%)	
Total # of Crisis Events with Recent YouTube Video Pre-Social Media Age: 51 of 71 (71.8%)			

Table 16: Pre-Social Media Crisis Events with Recent YouTube Videos

6.6.3 Type of Recent and Most Viewed YouTube Videos

During the survey study, I also visually examined the most recent YouTube videos for all 111 crisis events (if they had a video) in addition to the most viewed video for each crisis event. After coding and categorizing the videos, I found the following five types of crisis-related videos

frequently uploaded to YouTube: 1) **documentary films**, 2) **news footage**, 3) **montages**, 4) **retrospective montages**, and 5) **videos of current issues or events**. I also explain a few other types of videos that I suspect will increase in the future but currently are infrequent.

6.6.3.1 Documentary Films

Many of the YouTube videos associated with the crisis events selected in this study are professional and amateur documentary films. Documentary films are an art form typically used for educational purposes and with a storytelling format that many people are accustomed to seeing. Documentary films tend to illustrate significant phenomena that have affected society, thus crises are a common topic in this genre. Uploading these films onto YouTube allows viewers to watch them on demand without the constraints of waiting for it to be aired on television or purchasing the documentary film for discretionary purposes. Here, I discuss documentary films on YouTube that revive past crises by relating them to recent crises and by using the docudrama format. I also address the copyright issues that are emerging in YouTube.

Some documentary films on YouTube revive past crises by linking them to recent crises. For example, one YouTube video was a documentary film about the 1966 University of Texas massacre that included interviews mentioning the recent 2007 Virginia Tech school shooting. Similarly, the documentary film entitled *Buried* directed by Wang Libo is an independent film that focuses on the 1976 Tangshan earthquake. This film was released in 2009 and therefore also discusses the same issues that emerged after the recent 2008 Sichuan earthquake. These are both examples of a pattern I noticed throughout this study, where past crisis events were discussed in relation to recent related crises. Moreover, in the film *Buried*, it explains how seismologists in Tangshan and other earthquake experts in Beijing had predicted the earthquake and tried to communicate these scientific findings to Chinese officials in advance of the earthquake.

However, the film claims that the lack of evacuation plans in addition to the large amount of cover-ups by Chinese officials led to the deaths of at least 240,000 people. Since this is a controversial film likely to be banned because of its anti-Chinese government undertones, a YouTube user decided to make the entire documentary film available on YouTube. This is an early indication that YouTube has become a platform for widely disseminating films that may otherwise be buried or not easily accessible to the wider public.

Docudramas by the BBC illustrating historic crisis events are also commonly shared in YouTube. For example, the BBC Worldwide YouTube user uploaded a clip from their TV series *Superstorm* showing a high-tech 3D visualization of the 1970 Bhola Cyclone. In another case, a YouTube user, who was not affiliated with the BBC, tended to upload a variety of professional documentaries onto YouTube, one of which was a BBC documentary called *One Night in Bhopal*, dramatizing the series of events that led to the Bhopal gas leak. YouTube has recently begun to take down videos violating their policy on copyright infringement using multiple third-party notifications of this violation as a way of complying with the Digital Millennium Copyright Act (DMCA) that provides a "safe harbor" from strict liability for copyright infringement. Some of the videos initially viewed during the survey study are now no longer viewable.

In my previous studies on the use of Flickr during crises (Liu et al., 2008), concerns of copyright infringement were also raised when uploading screenshots of news footage during a crisis. Although copyright policies have long been around to protect the dissemination process of original works, my research findings indicate that copyright policies need to be revisited when the dissemination of copyrighted material are intended to spread news and inform the public as opposed to gaining financial rewards for redistributing these materials. Even though the sharing of documentary films on YouTube may be a copyright violation, it is another way in which the

memories of past historic events are relived and revived using on-demand technology. In the case of copyrighted materials and news footage of past crises, it is unclear whether footage from television news should be considered public domain and freely accessible. The next subsection describes the rise of news clips on YouTube.

6.6.3.2 Television News Clips

Some of the most commonly uploaded videos on YouTube related to the crisis events selected in this study are television news clips. The following are examples of some of the news clips found: 1) the CBS News report by Walter Cronkite broadcasted immediately after the 1979 Three Mile Island nuclear accident reporting on the potential health effects, 2) a BBC News report broadcasted during the 1979 Tiananmen Square protest, 3) a news report from a Germany news station reporting on the 1976 Seveso industrial disaster in Italy, 4) a news clip from Colombia after the 1985 eruption of the Nevado del Ruiz volcano with 13-year old Omayra Sánchez talking to journalists while trapped under debris, 5) a news clip from the Weather Channel reporting on the Great Blizzard of 1993 also known as Storm of the Century, 6) a CBS News Inside Story about the 2004 Indian Ocean earthquake and tsunami, and 7) a news clip from an India news channel of a live broadcast during the Mumbai attacks in 2008.

Before the digital age, recordings of these news reports either had to be obtained directly from the news agency or recorded on one's own video home system. In one case, a YouTube video recorded an ABC News clip of the 1993 Storm of the Century blizzard by using a video camera to record the external TV screen. In the digital age, people are finding new ways to capture and digitize news reports and share them online. All the news clip examples mentioned above were not uploaded by the news agencies but YouTube users who tended to upload archival footage. The sharing of these news clips broadcasted during the crisis events allows YouTube

viewers to re-experience the official reports broadcasted as the crisis unfolded. Although there are television news archives available to access some of these old news broadcasts, they are typically not freely available, searchable, and viewable online. Although many of these news clips on YouTube most likely violate copyright laws, they may be considered "fair use" particularly if they are intended to archive and preserve these news clips for educational purposes and for posterity. What warrants further investigation is how the preservation of these news clips through social media services may be informative for current crisis events. For example, news clips of the Great Blizzard of 1993 could provide a historical context for and be juxtaposed with the current Blizzard of 2011 in the US.

6.6.3.3 Retrospective Montages

Montages are also videos commonly shared on YouTube. With video editing software becoming more ubiquitous and user-friendly, amateurs are able to quickly create their own videos by remixing photos, videos, and music together. Many of the recent videos related to the crisis events in this study were mashups of photos depicting the aftermath of the crisis, like an earthquake or hurricane, accompanied with emotive or dramatic music in the background. Some videos were personally crafted. For example, one YouTube user created a video about the 1980 Love Canal disaster and shared his experience growing up near the Love Canal and living through the disaster. He used his personal photos from his childhood along with other images and captions to tell his Love Canal disaster story from the perspective of a survivor. Another user made a series of videos that were in the form of a movie trailer for the 1989 Loma Prieta earthquake and the 1991 Oakland firestorm using dramatic music, captions, and video footage taken during these crises. Many of the mashups also included news footage and satellite imagery of the crisis.

It is becoming increasingly common to create and find mashup videos on YouTube and mashup creators tend to use old photos and videos to revive the memories of past crises. Many of these YouTube videos were created and shared to commemorate the crisis and those affected by it. Therefore, I would argue that the ability to easily create mashup videos and share videos that raise awareness of a crisis have given people the opportunity to commemorate past crises in new ways. Crisis commemorations tend to occur on anniversary dates and/or near the impact zone of the crisis; therefore, these traditional public acts of remembrance are rituals that are limited in time and space. Some of these videos were uploaded on the anniversary dates but they are available almost indefinitely and to anyone that has access to YouTube to allow ongoing commemorations to occur.

6.6.3.4 Videos Clips of Related Current Events

One of the last types of YouTube videos I found documented current issues or events associated with past crises. For example, one video recorded a press conference where tennis star Maria Sharapova announced that she made a personal contribution to expand the United Nations Development Programme to help youth affected by the 1986 Chernobyl nuclear disaster. Another video of a press conference showed a spokesperson from a Bhopal victims rights organization suggesting the need to establish an all-party committee that would include representatives from other victims-rights organizations to collectively discuss ways of helping Bhopal victims. Many YouTube videos were also found documenting the post-genocide projects currently being implemented. A YouTube video by Aljazeera reported how landmines still remain in Nicaragua from the civil war in the 1980s in part because the flooding and mudslides caused by Hurricane Mitch in 1998 covered some of the unregistered minefields that were not found during the removal process of these landmines. Lastly, a YouTube video uploaded in 2006

showed how Alaska high school students found oil on the Prince William Sound beach by digging a shallow hole, pouring water in it, and observing how oil rose to the top. They attribute this oil to the 1989 Exxon Valdez oil spill that happened 17 years after at the time the video was made.

Many of these videos appeared in the search results of the crisis events selected in this study because the name of the crisis event appeared in the caption or tag of these YouTube videos. These text-based metadata fields are an important aspect to finding videos related to a specific topic or event, since digital search engines are largely based on text. Therefore, the textual content that people actively include in these videos largely influences the scope of the online presence for each crisis event and how it is represented in YouTube. Seeing the connections people make between recent events and past crisis events and then making these links visible to other users through search results is a way of communicating the ongoing aspect of these historic crises. What many of these videos showed was the long-term effects and recovery efforts that are still taking place long after the emergency period of the crisis event.

6.6.3.5 Prospective Videos

A wide variety of other videos were also uploaded onto YouTube that were more prospective-oriented. For example, a series of YouTube videos documented research simulations of magnitudes from historic earthquakes (i.e., 1989 Loma Prieta, 1992 Landers, and 1994 Northridge earthquakes) using large shake tables to test and demonstrate earthquake-resistant construction. Sharing these research projects through videos on YouTube was an attempt to educate the type of building construction needed in earthquake-prone areas as well as to promote the use of certain building material. Another video promoted a book related to climate change. Greg Craven uploaded a series of videos on YouTube based on his book called *What's the Worst*

that Could Happen? A Rational Response to the Climate Change Debate. In his video, he presents scenarios of potential futures that could occur based on certain responses to climate change.

Amidst the many promotional videos advertising a product, cause, or organization related to a particular crisis, there were some that communicated their message creatively and poetically. For example, two young filmmakers were asked to create "a unique kind of charity video" exploring the changes within Ethiopia as a result of receiving donations 25 years ago in response to the famine in the mid-1980s. In the caption of the video *Twenty5 – Ethiopia*, it states:

> *"We wanted an honest insight to what we saw, not an emotional piece of blackmail telling us what to feel or how to live. Why ask a few people to donate, when you can ask millions to simply share a video? We want the younger generation to be a part of something big. A new movement. A movement where simply passing on a video to your friends can save lives."*

The filmmakers implicitly make the claim that raising awareness by sharing a video that could potentially reach millions of people through online social networking services "can save lives" beyond just receiving donations from a few.

What these videos exhibit is a prospective way of reflecting on past crises to prepare for future crises. They communicate information that can facilitate hazard mitigation and strengthen community resilience. Therefore, I would argue that people are using YouTube to share affective videos that have the potential to influence future decisions as they relate to potential crises.

6.7 Presence in the Blogosphere

To determine which pre-social media crisis events exhibited a high presence in the blogosphere, I examined three types of data. The first type is an examination of the pre-social media crisis events that were ranked high based on the number of blog posts. The second type is a quantitative investigation of what types of pre-social media hazards and crises contained a

recent blog post (between May 2010 and August 2010). The third type is a qualitative investigation of the content that appears in these most recent blog posts.

6.7.1 Quantitative Blog Metric

Table 17 displays the number of blog posts found through Google Blog Search for the pre-social media crisis events that appeared in the Top 50 of this metric. For the 20 pre-social media crisis events in Table 17, the average number of blog posts for each crisis event is 38,353. For all 111 crisis events, 90% or 100 of the 111 crisis events had at least 200 blog posts with an average of 323,008 blog posts.

All 111 crisis events were mentioned in a blog post, which indicates that historic crises tend to be discussed more frequently in the blogosphere. However, it is important to take into account that obtaining the total and most accurate number of blog posts ever written about a particular topic may not be technically feasible, since not all blogs are indexed and algorithms within blog search engines tend to have biases in the results that are returned. Moreover, blogs exist in many different places online, unlike the previous social media services that have a dedicated website. There is not one single web service that hosts these blogs; instead, there are a myriad of blogging platforms people use and blogging features that people embed into their own websites. Therefore, it is important to consider the exposure and impact of a blog post given the possibilities of creating a blog post and having it be found.

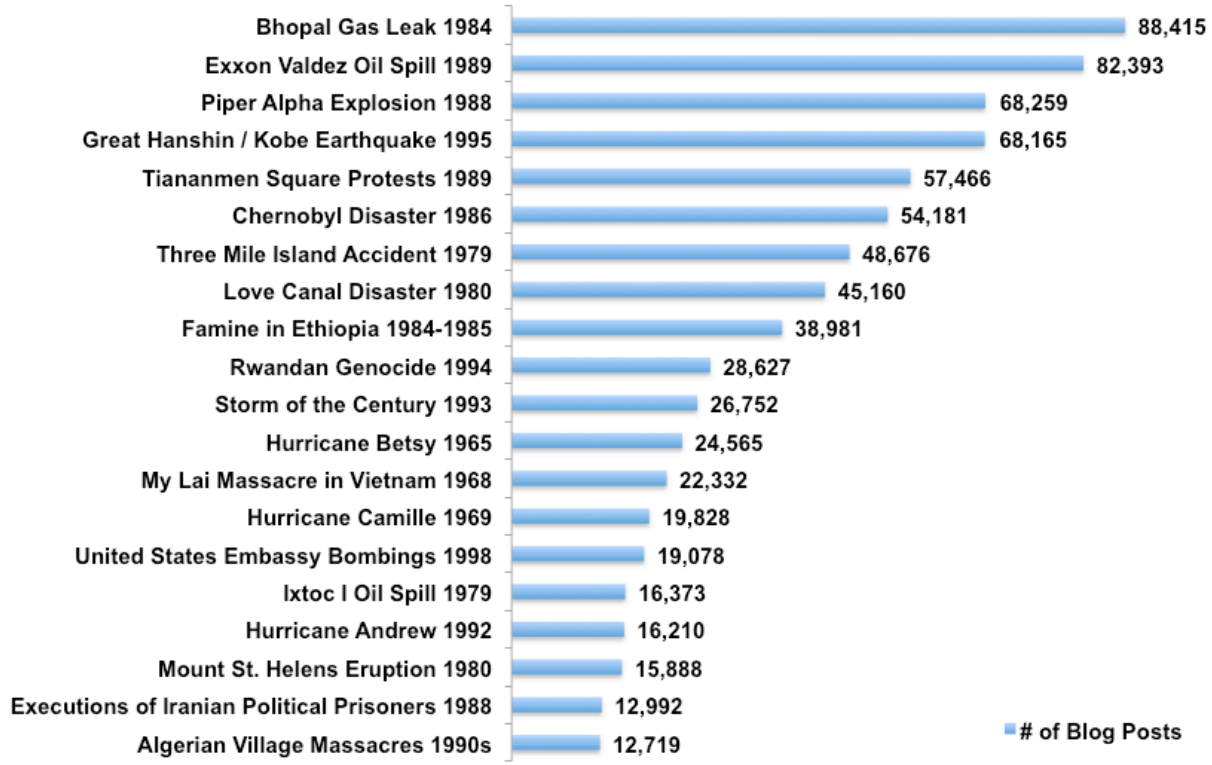

Table 17: Quantitative Blog Metric (Data Collection Period: June to August 2010)

The pre-social media crisis events that exhibited the highest presence in the blogosphere were primarily technological hazards. Of the first eight that appear in Table 17, six of them are technological hazards. The same four technological disasters (i.e., Bhopal gas leak, Exxon Valdez oil spill, Chernobyl, and Three Mile Island) have a high presence, but the presence of the **1988 Piper Alpha explosion** and the **1979 Ixtoc I Oil Spill** in the blogosphere may in part be because of the **2010 Deepwater Horizon explosion** that led to the **BP oil spill**. One reason why these events may have been revived by the BP oil spill is because the Piper Alpha event was one of the deadliest oil rig explosions in history and the Ixtoc I oil spill occurred in the same region as the BP oil spill. In addition to these technological hazards, the same natural and social hazards mentioned previously also exhibit a high presence in the blogosphere with the addition of the

1988 United States Embassy bombings. **The main trend that appears in the blogosphere is that those with the highest number of blog posts tend to be technological hazards**. This is an early indication that technological hazards tend to be discussed more frequently in the blogosphere. The next section describes the type of hazards and crises that exhibited recent activity in the blogosphere.

6.7.2 Recent Activity in the Blogosphere

Table 18 presents the type of hazards and crises that contained a recent blog entry posted between May and August 2010. Approximately 96% or 68 of the 71 pre-social media crisis events exhibited recent activity in the blogosphere. This is the highest number of crisis events that maintained a recent presence than the other social media services examined in this study. Approximately 92% or 37 of the 40 pre-social media natural hazard events contained a recent blog post. All 21 pre-social media social hazard events contained a recent blog post, and similarly, all 10 pre-social media technological hazard events contained a recent blog post. In the next section, I discuss the type of blog content that was posted more recently across all the crisis events to provide more descriptive findings of how historic crisis events maintain a presence in the blogosphere.

6.7.3 Type of Recent Blog Posts

After examining the most recent blog posts for all pre-social media crisis events, the following four types of posts were found: 1) **micro and macro retrospections**, 2) **linking recent crises with past crises**, and 3) **preparedness and proaction**.

Type of Hazard	Type of Crisis	Number of Events [By Type of Crisis]	[By Type of Hazard and Age]
Natural Hazards	Earthquakes	19 of 20 (95%)	**37 of 40 (92.5%) Pre-Social Media** 33 of 36 (91.6%) Pre-Web Age 4 of 4 (100%) Web Age
	Hurricanes	9 of 10 (90%)	
	Wildfires	3 of 3 (100%)	
	Blizzards	2 of 2 (100%)	
	Tornadoes	1 of 2 (50%)	
	Volcanoes	2 of 2 (100%)	
	Drought	1 of 1 (100%)	
Social Hazards	Famine	5 of 5 (100%)	**21 of 21 (100%) Pre-Social Media** 15 of 15 (100%) Pre-Web Age 6 of 6 (100%) Web Age
	Massacres	8 of 8 (100%)	
	School Shootings	3 of 3 (100%)	
	Political Protests	4 of 4 (100%)	
	Terrorist Attacks	1 of 1 (100%)	
Technological Hazards	Chemical Leaks	5 of 5 (100%)	**10 of 10 (100%) Pre-Social Media** 10 of 10 (100%) Pre-Web Age 0 of 0 (0%) Web Age
	Oil Spills	2 of 2 (100%)	
	Explosions	1 of 1 (100%)	
	Structural Failure	2 of 2 (100%)	
Total # of Pre-Social Media Crisis Events with Recent Blog Post: 68 of 71 (95.7%)			

Table 18: Pre-Social Media Crisis Events with Recent Blog Post

6.7.3.1 Micro and Macro Retrospections

Some of the most recent blog posts were retrospective, historical accounts of the crisis. For example, on the 5th anniversary of Hurricane Katrina, a youth journalism blog reposted a teenage survivor's first journal entry on August 29, 2005 sharing her experience of how Katrina affected her life starting the day she evacuated, which was then followed by a link to all her journal entries up until February 2008. Some blog posts provided an extensive historical overview of the crisis event and how the narrative of the crisis has changed over time.

Blog posts that contained ranked lists of the worst or deadliest disasters are, in some ways, macro retrospections, since they provide a temporal overview of historic crises that have affected society worldwide. Quite a few blog posts included these lists, and since the crisis events selected in this study appeared on these lists, the same blog post appeared multiple times in my search. Further investigation needs to be conducted to understand why people create and

share these disaster lists and how showing the deadliest or worst crises influences the way people simultaneously remember certain crises and forget others that may not be on these lists. Although these ranked disaster lists allow people to see the difference in severity among other historic crises, these macro retrospections lack the descriptive depth that appears in the micro retrospections for more specific crisis events.

6.7.3.2 Linking Recent Crises with Past Crises

Blog posts about recent crises often led to the commemoration of past crises and sometimes vice versa. Bloggers linked together different crisis events based on the type of crisis, the cause of the crisis, and/or the effects of the crisis. For example, blog posts that discussed 2005 Hurricane Katrina also mentioned 1965 Hurricane Betsy and 1969 Hurricane Camille, since all three hurricanes affected nearly the same region in the U.S. The 2010 Deepwater Horizon explosion and BP oil spill engendered blog posts that compared this oil spill to the causes and effects of other historic industrial disasters, such as the 1979 Three Mile Island accident, the 1984 Bhopal gas leak, and the 1986 Chernobyl disaster. Another blog post was intended to inform the commemoration activities (i.e., talks, special projects, and ceremonies taking place all around Chile) planned for the 50th anniversary of the 1960 Valdivia earthquake. It also provided a link to an online archive called *Terremoto 1960*[66], which was adapted to incorporate survivor stories from the recent 2010 Chile earthquake. In the social media landscape, the revival of past historic crises often occurs when they are linked to recent crises.

What this indicates is that people link the significance of past crises to present day crises, which is a way of moving beyond the temporal and spatial demarcations of crisis events. I would also argue that the way in which social media users link together past crises with present ones

[66] http://www.terremoto1960.cl/

exemplifies how disasters are not just single events but social processes linked by a broader set of causes, effects, and vulnerabilities that people are drawing attention to rather than just commemorating a single historic event in time.

6.7.3.3 Preparedness and Proaction

Beyond the retrospective linking of previous disasters to those that recently occurred, prospective posts encouraging preparedness and proaction also emerged in the blogosphere. For example, the recent BP oil spill reignited the issue of corporate accountability for industrial disasters like the Bhopal gas leak. Many posts reflecting on past historic earthquakes discussed the need for building codes to be more transparent, especially for high-profile sites like nuclear plants.

In the case of natural hazards, these are crises that may not be preventable but instead require preparedness. For example, some blog posts discussing the 1976 Tangshan earthquake claimed that many lives could have been saved if Chinese officials would have heeded the warnings from seismologists and formalized evacuation plans to better prepare for earthquakes. Similarly, some blog posts discussing the 1985 Nevado del Ruiz eruption claimed that many lives that were lost in Armero, Colombia could have been saved if Colombian officials would have heeded the warnings by volcanologists and followed their recommended steps to prepare and protect their citizens from the volcano eruption and the resulting mudslides. In both cases, bloggers discussed these disasters as preventable. In the context of natural hazards, this may not be an accurate way to articulate this since these events are naturally occurring phenomena that cannot be controlled. However, their main point was to explain how warnings were available far in advance of the emergency itself that should have been used to inform the affected population on what protective actions to take to strengthen their resilience to these imminent hazards.

6.8 Presence in Twitter

As previously mentioned, the data collected from Twitter cannot be directly compared with the other social media metrics collected for this study, since all tweets in Twitter are currently not available or searchable through the Twitter Search API. Instead, the purpose was to specify which crisis events were most mentioned in Twitter during the data collection period. Therefore, the number of tweets that contained words related to each of the 111 crisis events were collected. Table 19 shows 15 crisis events that had at least 100 tweets. Since this data was collected between June and August 2010, certain types of crisis-related tweets emerged, particularly for those with anniversaries that took place just before or during the same time period as the data collection.

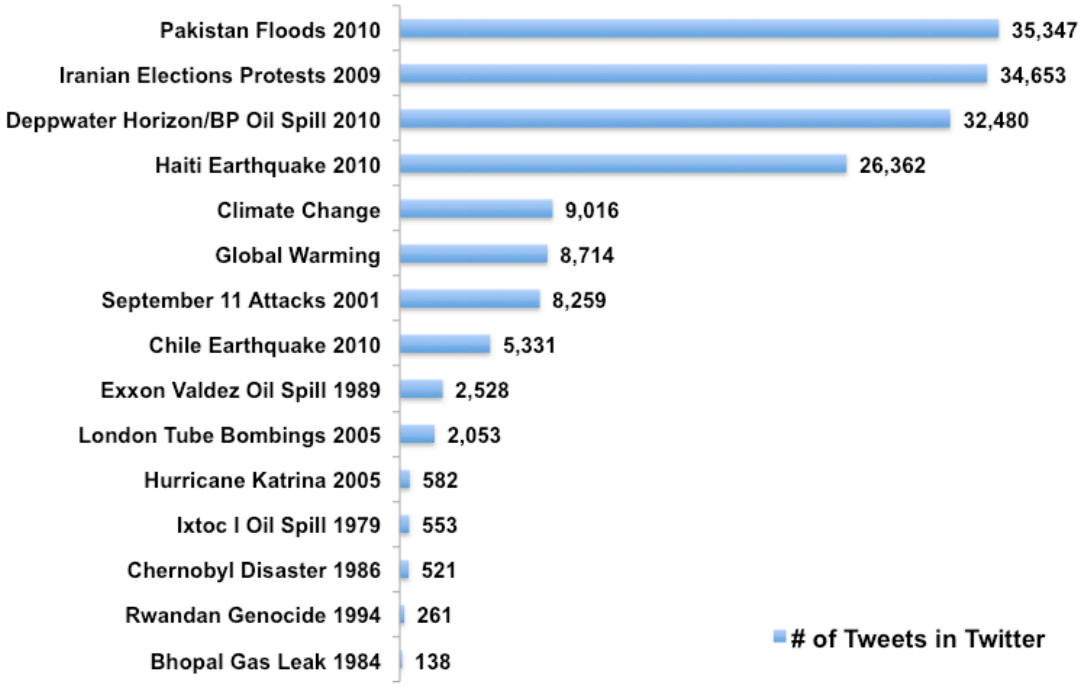

Table 19: Quantitative Twitter Metric (Data Collection Period: June to August 2010)

6.8.1 Tweets During the Emergency Period

In response to the January **2010 Haiti earthquake** and the February **2010 Chile earthquake**, many tweets referenced historic earthquakes like the **1960 Valdivia earthquake**. A considerable number of tweets also existed for the **2009 Iranian elections protests**, which was a crisis known for its unprecedented use of Twitter in the early stages of this political crisis with high media attention reporting this notable use of Twitter during this crisis. I suspect that supporters of this political crisis are still trying to maintain its Twitter presence by attaching the hashtag #iranelection to tweets directly and indirectly related to the Iran elections protests.

6.8.2 Linking Tweets of Current Crises to Past Crises

Some tweets contained information about the crisis as it was happening. For example, the **Pakistan floods** began in July 2010 and the **BP oil spill** was still leaking up until July 15 when it was capped. Both of these crises exhibited some of the highest number of tweets in comparison to other crisis events, which partly reflects how social media is increasingly being used during the emergency period of a crisis. Tweets related to the BP oil spill also mentioned the **1989 Exxon Valdez oil spill**, the **1979 Ixtoc I oil spill**, the **1988 Piper Alpha explosion**, the **2005 Texas City refinery explosion**, and the **1986 Chernobyl disaster**. Some tweets mentioned the **BP oil spill** and referenced **Hurricane Katrina**, since the oil spill occurred just before the anniversary of Hurricane Katrina and they both affected the Gulf of Mexico. Therefore, a crossover of these two crisis events occurred due to similarities in location and timing; yet, the 5th anniversary of **Hurricane Katrina** also revived previous historic hurricanes, namely the **1965 Hurricane Betsy** and the **1969 Hurricane Camille**.

6.8.3 *Linking Past Crises to Other Related Events*

Based on findings from my previous collections of tweets from Twitter regarding the **2001 September 11 attacks**, I noticed that more tweets occurred during the anniversary as well as when other current events related to the attacks emerged, such as the controversies around the building of a mosque near ground zero in May and August 2010 as well as the **Zadroga 9/11 Health and Compensation bill** that was passed in December 2010. Another trend that emerged was that tweets on the anniversary of the July **2005 London bombings** contained tweets referencing the **2004 Madrid train bombing** and the **2008 Mumbai attacks**. Tweets also emerged during the anniversary of the **1994 Rwandan Genocide** between April and July 2010 with references to the atrocities that happened in Congo. Lastly, based on my previous collections of tweets related to **climate change** and **global warming**, it was evident that a large number of tweets emerged when climate-related events took place, such as **Earth Day**, the **COP15** and **COP16** United Nations Climate Change conferences, and the **350.org** climate action events. Tweets that mentioned climate change or global warming also referenced news reports, government actions, solutions, and observations of weather changes related to the climate.

6.8.4 *Fluctuating Trends in Twitter*

Based on these crisis commemoration trends found in Twitter, I anticipate the number of crisis-specific tweets returned from the Twitter Search API will likely fluctuate over time with peaks during crisis anniversary dates and around current events related to these crises. Commemoration trends in Twitter also show how crisis events are often mentioned in relation to each other. Clustering different crisis events together based on how often they are mentioned in each other's datasets may indicate deeper correlations between these events and illuminate common causes, effects, and vulnerabilities between these crisis events. Twitter has become an

important social media service during crises, but more tools are needed to understand the type of commemoration trends emerging in this real-time communication service.

6.9 Presence in Online Digital Archives

In this last section of this chapter, I present the pre-social media crisis events that exhibited a high presence in online digital archives. I primarily chose to focus on data from Archive-It, a subscription service designed to facilitate user-generated collections of "born-digital" content for long-term preservation purposes. I consider Archive-It a type of social media service because the subscribers (i.e., state archives, university libraries, federal institutions, state libraries, non government non profits, museums, historians, and independent researchers) decide what to include in their collections, and then these collections become publicly available. I also include data from the Library of Congress to compare the number of artifacts that exist for these crisis events at a US federal cultural institution with the number of artifacts that exist in the bottom-up collections at Archive-It.

Table 20 displays a ranked list of pre-social media crisis events that exhibited a high number of artifacts in Archive-It with the events sorted based on this number. It also includes the number of artifacts that exist at the Library of Congress based on the results returned in their search engine. For the 30 pre-social media crisis events in Table 20, the average number of Archive-It results is 96,460 and the average number of Library of Congress results is 120. For all 111 crisis events, the average number of Archive-It results is 401,037 and the average number of Library of Congress results is 75. These findings from the quantitative metrics for Archive-It and the Library of Congress provide a numerical average of what it means to have a high presence in Archive-It and the Library of Congress for events that occurred before the age of social media as well as across all 111 crisis events. Due to the large number of results that appear in Archive-It

and its limited interface for browsing the search results, I chose not to look at the types of artifacts that appear in the Archive-It and Library of Congress search results. Instead, I discuss the specific types of hazards and crisis events that exhibit a trend in online digital archives.

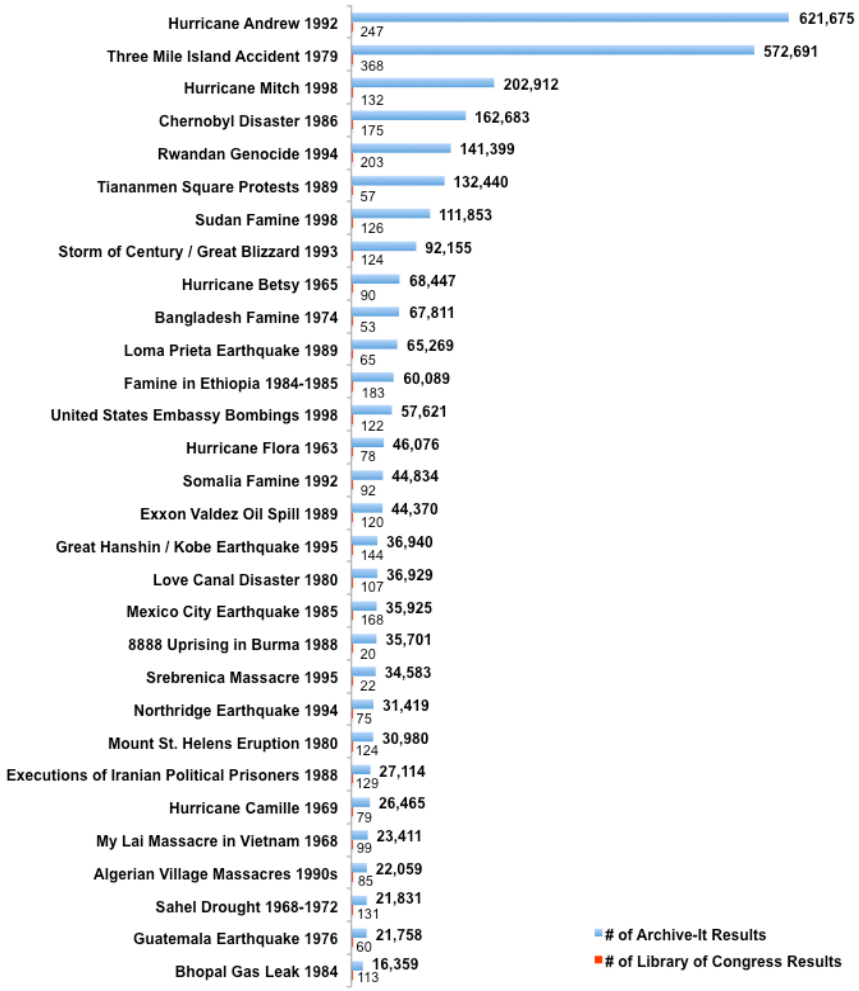

Table 20: Quantitative Digital Archive Metrics (Data Collection Period: June to August 2010)

6.9.1 High Presence in Archive-It

The **1992 Hurricane Andrew** contained the highest number of Archive-It results of the pre-social media crisis events. This trend is reflected in some of the other social media services; however, other natural hazard events (e.g., Mount St. Helens eruption, Great Hanshin/Kobe earthquake, and the Loma Prieta earthquake) exhibited a higher presence in those services. The

number of Library of Congress results for Hurricane Andrew also reflects a similar high presence when compared with the Library of Congress results for other crisis events. The **1979 Three Mile Island accident** also contained the second highest number of Archive-It results, which again is reflected in some social media services but not all. This crisis event also contained 368 Library of Congress results, which is the second highest number just under the 2001 September 11 attacks, which contained 462 results. One reason why the Three Mile accident has a high presence in Archive-It may in part be because this was a U.S. industrial accident, and Archive-It, which is based in the U.S., largely serves English-language artifacts. However, further research needs to be conducted to analyze what types of artifacts appear in these collections and why the Three Mile Island accident has a much higher number of results than crisis events like the Chernobyl disaster.

In general, the same number of natural and social hazard events have a high presence in Archive-It in addition to the same five technological hazard events. **Findings from this quantitative metric reveal other natural and social hazard events, which did not have as high of a presence in the other social media sites, show a high presence in Archive-It.** For example, a large number of digital artifacts exist for the **1974 famine in Bangladesh**. Some have estimated that more than one million deaths occurred, which is more than the **1998 Sudan famine** and the **1992 Somalia famine** (both of which had a high presence in other social media services). On other finding was that the **1963 Hurricane Flora** exhibited a higher presence here than in the other social media services. Hurricane Flora was the sixth deadliest Atlantic hurricane that killed approximately 8,000 people, which is more than Hurricane Andrew, Betsy, and Camille. However, as I previously mentioned in Section 6.1, crisis events with high number of deaths do not always indicate that it will have a high social media presence.

6.9.2 Comparing Archive-It and the Library of Congress

Moreover, Table 20 also shows how **the number of Archive-It results does not always correlate with the number of results that appear in the Library of Congress**. For example, the Tiananmen Square protests exhibits a high number of Archive-It results but a much lower number of Library of Congress results in comparison to other crisis events. On the other hand, the 1985 Mexico City earthquake received a comparably high number of Library of Congress results but exhibits a considerably lower number of Archive-It results than the average. This may be an indication that the Library of Congress may have a higher number of artifacts for US-based events than events that happen abroad.

Future research needs to be conducted to compare the thousands of digital artifacts in the Archive-It collection with the Library of Congress collection to better understand, for example, why a much larger amount of results are returned in Archive-It for these particular crisis events. One reason why Archive-It contains more artifacts may in part be because it includes websites that are periodically web crawled to capture changes to a site over time; thus, their results may include time series data. Also, Archive-It tends to include snapshots of thousands of websites, whereas the artifacts that appear in the Library of Congress search engine tend include professional publications, such as books and legislation bills. What these findings from the online digital archives indicate is how these data can inform one another by indicating which crises are represented in one but not the other.

6.10 Implications of Survey Findings

Based on the empirical findings from this survey study, it is evident that people are using social media to digitally commemorate certain historic crises and, in some ways, revive them in the networked world. In this chapter, I explained some of the crisis commemoration trends

emerging in Wikipedia, Facebook, Flickr, YouTube, the blogosphere, Twitter, and online digital archives. **A common theme that emerged when looking at the types of social media content being shared about crisis events that occurred before the social media age is that these events would often be discussed in the context of more recent crisis events that exhibited a similar set of causes, effects, and vulnerabilities.** What this signifies is that people are trying to link a series of related crisis events together to elevate the discussion beyond just a single event and towards the multidimensionality of these crises. Furthermore, what is beginning to emerge is a living history evidenced by the digital traces people are sharing online. The histories of past crises are increasingly being scattered online and revived in socially-distributed ways. Current advancements in network technology are allowing people to more quickly see the links and make links between related crises.

Findings from this survey also revealed hazard-related trends. Social and technological hazards tended to exhibit a stronger presence than natural hazards across many of the social media services. Social and technological hazards are anthropogenic or human-induced crises. I speculate that these hazards tend to have a higher social media presence because these types of crises are preventable and controllable, unlike most natural hazards. Therefore, there is a sense of agency that exists with social and technological hazards that possibly compel people to keep the memories of these crises alive with the hopes that future generations will prevent these disasters from happening in the future. The social media presence for natural hazards tended to focus on the sharing of experiences during the emergency periods of these events and how to be prepared for these natural hazards in the future. Therefore, regardless of the type of hazard agent, much of the content being shared through social media tended to urge ways of strengthening community resilience to future crises by learning the lessons from past crises.

Conducting a broad survey of how social media is being used for both past and recent crises can provide valuable insights to all stakeholders (i.e., emergency response agencies, humanitarian organizations, NGOs, concerned citizens, etc.) about how people interpret past crises over time as well as how crises are being documented in real-time. The value of how people share retrospective accounts of past crises may lie in what lessons can be learned to inform the response to future crises. Understanding how recent crisis events unfold in the social media landscape can provide insights on how different stakeholders may actively participate in the crisis response milieu that is increasingly taking place online through social media channels. This broad survey of determining the social media presence for 111 crisis events provides quantitative and qualitative baselines of social media content being generated for historic events to guide future archiving efforts. History is increasingly being shared and preserved through social media services but much of its value will depend on how society harnesses cyberinfrastructures to collect, store, manage, mine, and analyze historical data for the benefit of present generations and those living hundreds of years from now.

6.11 Summary

After conducting a survey that analyzed the social media presence for 111 crises, findings from the quantitative and qualitative social media metrics revealed that social media is also being used to commemorate past crises. This chapter compared the social media presence of historic crises that took place over the past 50 years as well as explained which crises were being revived and the type of content being shared to keep the memories of these past crises alive. The crisis commemoration trends and the type of social media content found in this study helped to inform the types of narratives found in the four crisis events I investigated. I discuss the narratives that make up the living heritage of two crises in the next two chapters.

CHAPTER 7
THE 1984 BHOPAL GAS LEAK CASE

On December 3, 1984, over 40 tons of toxic gas called methylisocyanate (MIC) leaked from Union Carbide's pesticide plant in Bhopal, the capital of Madhya Pradesh, India. The number of deaths remains debated. Official estimates by the Government of Madhya Pradesh in India tabulated around 3,787 immediate deaths[67] and 11,000 casualties (Browning, 1993), but others estimate as many as 8,000 to 10,000 immediate deaths occurred while leaving as many as 200,000 permanently injured with long-term health effects (Perrow, 2007; Eckerman, 2005). The current death toll is now estimated to be around 25,000 and rising since half a million Bhopalis were exposed to the gas. As such, many consider the Bhopal gas leak to be "the world's worst industrial disaster" because it is the deadliest chemical leak in history. Warren Anderson, the Chairman of Union Carbide Corporation at the time, was arrested soon after the gas leak and charged with culpable homicide, but he was immediately released by the Indian government and remains an absconder.

In this chapter, I present five types of meta-narratives that emerged from my interpretive analysis to illuminate the complex story of the 1984 Bhopal gas leak that has unfolded in the social media landscape.

- Section 7.1 presents narratives that explain the cause of the gas leak.
- Section 7.2 presents narratives from survivors and about the survivors of the gas leak.
- Section 7.3 presents narratives about the ongoing crises related to the gas leak.
- Section 7.4 presents narratives from scientific reports about the effects of the disaster.
- Section 7.5 presents narratives about direct actions in response to the Bhopal tragedy.

[67] http://www.mp.gov.in/bgtrrdmp/relief.htm

Table 21 delineates the social media artifacts that encompass the 1984 Bhopal gas leak social media web sphere. In this chapter, I reference some of these artifacts.

Social Media Artifacts in Bhopal Gas Leak Web Sphere			
Wikipedia	2,412 Edits 0.8 Edit/Day 1,137 Editors 147 Watchers 77 References	**Twitter**	6,308 Tweets 3,323 Twitter Users 2,779 URLs
Facebook	73 Groups 70 Pages 32 Causes	**Blogosphere**	88,415 Blog Posts
Flickr	374 Images 1 Group	**YouTube**	602 Videos 155 Playlists
Delicious	1,122 Bookmarks	**Digg**	166 Digg Results
Archive-It	16,359 Results	**Mashups**	4 Results

Table 21: Social Media Artifacts in Bhopal Gas Leak Web Sphere

7.1 The Cause of the Bhopal Gas Leak

In this section, I discuss the complex set of narratives that describe the cause of the leak. The Bhopal gas leak was a technological, man-made hazard at the Union Carbide pesticide plant in Bhopal, India. Everyone agrees the cause of the 1984 gas leak was that water entered a tank that contained the MIC gas, which resulted in an explosion that caused the gas to leak into the atmosphere. However, beyond this fact, there are discrepancies with how and why this happened. Therefore, I first present Union Carbide's account of what they believe was the cause of the gas leak in their pesticide plant. This sets the stage for presenting the counter-narratives that appear in the social media landscape, particularly in Wikipedia.

7.1.1 Union Carbide's Story

To explain the cause of the 1984 Bhopal gas leak, I begin with Union Carbide's account, since the gas leak originated from one of their pesticide plants. The Union Carbide Corporation

(UCC or UC) created a *Bhopal Information Center* website[68] to communicate their involvement and stance concerning the Bhopal disaster. This static website is the only online presence that UCC has created to communicate their version of the Bhopal gas leak. The purpose of presenting UCC's story first is that their simplistic story of the crisis provides a helpful starting point before I juxtapose it with the complex set of narratives that have emerged in the social media landscape about the Bhopal gas leak.

The Frequently Asked Questions page of UCC's Bhopal.com website addresses many of the accusations against the Union Carbide Corporation. In answering what they believe caused the gas leak, UC states:

> *"An initial investigation by Union Carbide experts showed that a large volume of water had apparently been introduced into the methylisocyanate (MIC) tank. This caused a chemical reaction that forced the pressure release valve to open and allowed the gas to leak. A committee of experts working on behalf of the Indian government conducted its own investigation and reached the same conclusion. An independent investigation by engineering consulting firm Arthur D. Little[69] determined that the water could only have been introduced into the tank deliberately, since process safety systems—in place and operational—would have prevented water from entering the tank by accident."*

In 1988, UC concluded that "employee sabotage—not faulty design or operation—was the cause of the tragedy." Jackson B. Browning (1993), the Vice President of the Health, Safety, and Environmental Programs at UCC at the time of the gas leak, officially documented the sabotage theory in a report, which states:

> *"Although it was not known at the time, the gas was formed when a disgruntled plant employee, apparently bent on spoiling a batch of methylisocyanate, added water to a storage tank."*

Therefore, Union Carbide's narrative of the Bhopal gas leak begins in 1984 on the night of the gas leak and claims that it was simply caused by "employee sabotage." Since Union Carbide is

[68] http://www.bhopal.com/
[69] http://www.bhopal.com/pdfs/casestdy.pdf

not a governmental body and has no authority to officially arrest or charge anyone, they decided not to disclose the name of this employee. However, UCC asserts, "Indian authorities refused to pursue this individual because they, as litigants, were not interested in proving that anyone other than Union Carbide was to blame for the tragedy."

Some argue that the cause of the gas leak was due to the plant's faulty safety equipment and security systems that were evident prior to the 1984 gas leak. Although UC admits to the safety concerns reported in the 1982 safety audit, they claim that all the safety issues were addressed before the leak and none of them would have caused the gas leak. One reason for the continued lack of assigned responsibility regarding the Bhopal gas leak is the complexity of the legal ownership of the Bhopal pesticide plant facility. Although Dow Chemical inherited the responsibility to clean up the Bhopal plant after acquiring Union Carbide, UCC claims:

> *"Union Carbide India Limited (UCIL) owned, operated and managed on a day-to-day basis the Bhopal plant…Today, UCC still remains a separate company, but its stock now is fully owned by The Dow Chemical Company. UCC had settled all civil claims related to the gas release with the Government of India and was no longer doing business in India when Dow acquired its shares in 2001. Dow did not inherit any liability from UCC."*

In addition to addressing the complex legal ownership of the plant, the Indian government became more heavily involved with this legal dispute after passing the Bhopal Gas Leak Act in March 1985, allowing the government of India to act as the legal representative for those affected by the 1984 gas leak. In 1989, an out-of-court settlement was reached between UCC, UCIL, and the Indian government regarding the deaths and injuries from the gas exposure. In 1998, the Madhya Pradesh State Government of India took over the facility, who then became responsible for cleaning up the Bhopal plant and completing any additional remediation,

according to UCC. However, Shana Bluestein Ortman, who works for the International Campaign for Justice in Bhopal,[70] clarified:

> *"While UC did manage to get out of it's lease with the MP Gov't, that did not make clean up and remediation the responsibility of the MP gov't, the polluter pays principle is still in affect and UC (now Dow Chemical) is still responsible for cleanup and remediation, even if they do now own the land."*

The Bhopal gas leak has raised important questions regarding how to govern corporate accountability issues for catastrophes involving multiple jurisdictions as well as resulting in mass casualties and serious long-term health effects. After observing the narratives in the social media landscape regarding the cause of the gas leak and entities responsible for this tragedy, it was evident that the cause was a complex set of events exacerbated by legal liabilities between a multinational corporation and a federal government. Although UCC, UCIL, and the Government of Madhya Pradesh do not have an active social media presence (except in the case of Dow Chemical, which owns UCC and recently joined Twitter and Facebook in 2008), their version of the Bhopal story typically emerges when they are juxtaposed with the myriad of other narratives that appear in the social media landscape, which counter their official account.

7.1.2 Historical Causes Revealed through Wikipedia Edits

People increasingly use social media services like Wikipedia (ranked at #8 in Alexa) to find accessible descriptions about historic events like the Bhopal gas leak. One reason is because the first search result that appears from a Google search of "Bhopal disaster" or "Bhopal gas leak" is the *Bhopal disaster*[71] English Wikipedia article. To better understand the evolution of this article, I interviewed its top contributor, Ingrid Eckerman, who made approximately 17 percent of the edits (433 of the 2,550 edits). Her edits reflect her expertise as a family physician

[70] http://bhopal.net
[71] http://en.wikipedia.org/wiki/Bhopal_disaster

in Sweden, her knowledge after receiving a Master of Public Health degree, and her experience as a medical advisor at the Sambhavna Trust Clinic in Bhopal, where they provide free healthcare services to gas-affected survivors. Her first visit to Bhopal was in 1994 when she became a member of the International Medical Commission on Bhopal.

In 2004, Dr. Eckerman published a book entitled *The Bhopal Saga: Causes and Consequences of the World's Largest Industrial Disaster*, which includes an analysis of over 200 sources containing facts related to the Bhopal disaster between the 1960s during the Green Revolution and 2003. She applied her expertise and comprehensive analysis of the Bhopal disaster to produce publications that covered the technical, medical, economic, social, psychological, and environmental aspects of the disaster. Starting in October 2006, she decided to use the contents and structure of her *Bhopal Saga* book as a guide for editing the *Bhopal disaster* Wikipedia article. In an email interview with Dr. Eckerman, she explained:

> *"The article initially focused on guilt, on pollution, on legislatives, on Warren Anderson. There were very little facts about the disaster itself, the consequences etc. The interest was on compensation, legal issues and pollution—which started AFTER the disaster. Much of it was about the last years. The information about the disaster itself was rudimentary. The facts that were there were not always true, often exaggerated. Also, there was a mess of the references, many bad references like from daily or weekly press, TV-news etc. It was not trustworthy; it was also considered 'POV' [point of view]."*

Therefore, she added detailed content about the pre-event phase, the gas leak itself, and the immediate post-event phase of this disaster. This information is represented in the first six sections of the *Bhopal disaster* Wikipedia article, which are as follows: (1) *Summary of background and causes*; (2) *Contributing factors* (work conditions, equipment and safety regulations); (3) *History/previous warnings and accidents*; (4) *The leakage* (timeline); (5) *Health effects* (short and long-term); and (6) *Aftermath of the leakage* (compensation from Union

Carbide, economic rehabilitation, occupational rehabilitation, habitation rehabilitation, environmental rehabilitation, health care).

In contrast to Union Carbide's interpretation of what caused the gas leak (i.e., employee sabotage), the Wikipedia article provides an extensive list of causes that many believe contributed to the gas leak. For example, in the *Contributing factors* section, it states that "the use of a more dangerous pesticide manufacturing method, large-scale MIC storage, plant location close to a densely populated area, undersized safety devices, and the dependence on manual operations" together caused the gas leak or at least exacerbated it. More specifically, the plant was located in a densely populated area where Bhopali residents were not informed in advance of what protective actions to take or how warnings would be communicated. The article also states, "Plant management deficiencies were also identified – lack of skilled operators, reduction of safety management, insufficient maintenance, and inadequate emergency action plans." In addition, the article enumerates 12 problems associated with equipment and safety regulations as well as nine previous warnings, accidents, and gas leaks between 1976 and 1984 (just months before the gas leak).

7.1.3 Juxtaposing the Complex Causes

The *Bhopal disaster* Wikipedia article portrays a complex set of narratives pertaining to the cause of the Bhopal gas leak that is in stark contrast to UCC's statements on their *Bhopal Information Center* website. One of my participants, Colin Toogood, who works for the Bhopal Medical Appeal[72] and leads their social media campaign, stated that "the information contained in UCC's website is, at best, disingenuous." This is in part why the International Campaign for

[72] http://www.bhopal.org

Justice[73] (ICJB) decided to create a spoof of the UCC's Bhopal.com website called TheRealBhopal.com[74] that juxtaposes each of UCC's statements with a more accurate version written below each statement. For example, the following statements were juxtaposed:

> ***UCC's Statement****: The 1984 gas leak in Bhopal was a terrible tragedy, which understandably continues to evoke strong emotions even 20 years later. In the wake of the gas release, Union Carbide Corporation, and then-chairman Warren Anderson, worked diligently to provide aid to the victims and set up a process to resolve their claims. All claims arising out of the release were settled 15 years ago at the explicit direction and approval of the Supreme Court of India.*
>
> ***ICJB's Statement****: The 1984 gas leak in Bhopal was a terrible tragedy which continues to evoke in Union Carbide and its owner Dow Chemical strong emotions fear and contempt: fear of being found guilty in a criminal case they are fugitives from, and contempt for their victims and the law. In the wake of the disaster, Carbide and Warren Anderson worked diligently to delay legal proceedings, misinform doctors, hide assets and deny adequate relief. Civil claims were ended 13 years ago: environmental damages, criminal charges and, potentially, punitive and restitutionary damages, remain pending.*

One of the few rules that Wikipedia mandates is their neutral point-of-view (NPOV) policy to try to present content that does not advocate one single point of view. Therefore, content from UCC's Bhopal Information Center website appears in the *Union Carbide's Defense* section of the *Bhopal disaster* Wikipedia article and is represented as one side of the Bhopal disaster narrative.

The numerous causes of the gas leak mentioned in Wikipedia also appear in other social media services; however, they are often hidden as a comment to a YouTube video or a blog post. After analyzing a myriad of social media content (i.e., Wikipedia article and its Discussion page, blog posts, Flickr photos, YouTube videos, and Facebook wall posts) associated with the Bhopal gas leak, the findings reveal that there are at least three narratives that explain the cause of the 1984 gas leak and the other issues that exacerbated the effects of this leak. They are as follows:

[73] http://bhopal.net
[74] http://www.therealbhopal.com

(1) the lack of corporate responsibility by the Union Carbide Corporation and the Dow Chemical Company, (2) the failure of the US and Indian legal systems in providing adequate justice and compensation for the Bhopali survivors, and (3) the collusion between corporations and governments protecting their commercial and investment interests. As these causes become increasingly communicated through social media channels, there is an urge by Bhopali survivors and those in solidarity with them to affirm these root causes and to explain the calamitous effects that resulted from the exposure to Union Carbide's pesticide chemicals.

7.2 Bhopal Survivor Narratives

Narratives from and about the survivors of the Bhopal disaster depict what happened the night of the gas leak and its aftermath from a survivor's point of view. First, I present stories from survivors and include secondhand stories describing the unsung heroes during the gas leak and the generally unknown protective actions that were not widely communicated. Then, I discuss the brief appearance of witness accounts in the *Bhopal disaster* Wikipedia article. Last, I explain the use of visual media as another way of communicating survivor stories.

7.2.1 Stories of the Unsung Heroes and the Generally Unknown Protective Actions

It may not be surprising that stories from and about survivors are resurfacing through social media, but common themes that appeared within some of them are commemoration of the unsung heroes and communication of protective actions that could have been taken to mitigate the effects of chemical inhalation. I present four stories of this type that appear in the *Students for Bhopal*[75] Facebook group, a blog post, and in Twitter.

[75] http://www.facebook.com/group.php?gid=2206855545

In July 2008, Sachin Jain created a Discussion Topic[76] entitled *What's your story.. on the fateful night of Dec 3, 1984?* and shared his survivor story. He was three years old at the time of the gas leak. His dad put him on his shoulders as they evacuated their home. This exposure to the gas at that height caused him to now wear eyeglasses. As they ran from the gas, he remembered, "somebody suggested to go near the lakes as the gas is soluble in water & so the amount of gas in the air there would be less." By the time they reached the lake, the gas had finally dissipated and his whole family survived. In addition to his personal story, he drew attention to a story he will never forget. It is that of the night watchman at the Union Carbide plant who first noticed the leak. Jain explains:

> *"If he had gone to inform anybody, the amount of gas leaked by then would have killed everyone in the city…The only way out was to stop the outflow at the very moment. He put his finger in the valve & shouted for help. And by the time other workers came & could close it totally, enough gas had leaked by then. The man died…If that man would not have done this, I would not have been writing this. But to hide the facts, his deed was buried deep in the bureaucratic shit. But he's my personal hero."*

One reason Jain posted his survivor story on Facebook was to share something different from what he found in most blog posts about the 1984 Bhopal gas tragedy. He felt that many of the other posts focused "on things which never mattered or [were not] of any concern to any bhopalites;" therefore, he decided to use this Facebook group "to tell [his] part of the story." Jain's story attempts to move beyond one that just incites sympathy, toward an account that provides details about what he personally experienced as a Bhopal survivor, how he was informed of a protective action taken that was momentarily shared during the gas leak, and about an unsung hero who sacrificed his own life to save thousands of other Bhopalis.

[76] http://www.facebook.com/topic.php?uid=2206855545&topic=5690

A similar but secondhand account appears in another *Students for Bhopal* Facebook group Discussion Topic[77] entitled *Getting Involved*. Bhavna Suri from New Delhi, India, shares a story she received from a Bhopali native that she met during her first visit to Bhopal in 2007. She describes how this Bhopali native, who was a teenager at the time of the gas leak, had a close relative working at the Union Carbide plant who died while trying to fix the leak. She goes on to explain the lack of crisis communication that occurred on the day of the gas leak through the secondhand memories from a Bhopali native:

> *"The knowledge that a disaster was going to happen was known to UC officials earlier in the evening ~ 5pm. The gas leaked into the city around 11 pm at night, when most of the people in the immediate area of the UC plant were at home. None of them were warned about the potential disaster. The only people who supposedly knew were politicians and government officials, who had fled from the vicinity. This happened in the era when there were no cell phones, text messaging, email and there was only one sleepy government run TV channel in India (was the impact on the rest of the world, lesser because of it....absolutely!)."*

Suri's post among others in this Facebook group highlights how mainstream media outlets at the time could have played an important role in effectively communicating information about the crisis. Additionally, the negligence on the part of UC and the Indian government weakened Bhopal residents' ability to be resilient to this crisis that was already foreseen. If the Bhopal gas leak happened today in the era of digital and networked communications, would it make a broader impact on the rest of the world? Trends in social media use during recent disasters provide a glimpse into how these technologies can play a critical role in communicating timely and actionable information that could potentially save lives.

The third story appears under the Discussion Topic entitled *Never Sleep At Night In Bhopal* posted in October 2006 with a shortened version posted on the wall of the *Students for*

[77] http://www.facebook.com/topic.php?uid=2206855545&topic=1604

Bhopal Facebook group. Ash Sethi[78] shares the following "story of heroes and villains" recounting "the best of India and the worst of India" on the night of the gas leak:

> *"Hundreds of brave medical students from a local university…awoke in the middle of the night, armed only with wet towels to protect themselves, and rushed to the streets of Bhopal to rescue and treat gas victims. They ran into certain death, young boys barely in their 20's, to save people they never met, people who had been cast aside, poor, starving, and never more so helpless. Calling every hospital, pharmacy, and doctor they could, they organized clinics to treat the wounded when police were running away as fast as they could. They fought like soldiers, like real Indians do, and saved thousands. Railway engineers scrambled to get people on trains and out of Bhopal. Some of these heroes survived, and are lucky to suffer for their nobility, many bedridden and invalid. The politicians profited, Carbide closed its eyes, and the world slept. That is Bhopal."*

In this account, the medical students became the "heroes" who presumably sacrificed their lives to help save those suffering from gas exposure. They were also some of the few people in the affected population who knew the simple steps that needed to be done to prevent death from the gas leak (e.g., cover face with wet cloth). Some telephoned Kumkum Saxena, a medical officer who resigned from Union Carbide in 1982 because of UCC's lack of safety measures. Based on her previous experience treating Union Carbide workers exposed to the toxic chemicals from previous leaks at the plant, she told callers that evening, "You should stay inside and put wet cloths along your doors and windows to prevent gas from leaking into your house. If you have to go outside, go against the wind. Put a wet cloth on your face to dissolve the gas." Such simple protective actions, which were known primarily by medical professionals, could have saved thousands of lives. This information now appears in artifacts available online, such as in BBC's *One Night in Bhopal*[79] 2004 docudrama posted on YouTube and in an online magazine article[80] titled *Why I Quit Carbide Before 1984*.

[78] http://www.facebook.com/topic.php?uid=2206855545&topic=1698
[79] http://www.youtube.com/watch?v=v7JBpE0choc
[80] http://www.tehelka.com/story_main45.asp?filename=Ne030710quitcarbide.asp

The last survivor story presented here is a blog post[81] by Mani Padma entitled *Survivor story – Bhopal Gas tragedy* posted on June 17, 2010. Padma is a doctor in New Delhi, India, and shares a story from Dr. Jayshree about what happened the night of the gas leak. She begins with a "heroic story of a station master." Upon realizing the severity of the gas leak, he "valiantly attempted to signal all trains not to stop." He was committed to preventing others from being exposed to the gas; thus "he kept on at his post trying to contact stations to stop entering the city instead of fleeing and taking cover and in the process he lost his life." The memory of the station master also appears in Twitter. On the 26th anniversary of the Bhopal gas leak, a Twitter user sent out the following tweet to pay tribute to this unsung hero: "#Bhopal gas tragedy this day my thanks to stationmaster bhopal who stopped 4 trains at outer signal saving thousands."

Padma continues her blog post explaining how Dr. Jayshree's family survived because "they had slept with the windows tightly shut and were safely tucked in bed underneath thick blankets" because of the cold winter night. She also emphasized, "When the gas leaked, it was reported that the alarms were not sounded and the workers fled the site immediately without activating the (almost non existent) emergency management systems." Similar to the previous survivor stories, Padma's blog post highlights another unsung hero and the lack of official emergency plans on the night of the gas leak.

In summary, three unsung heroes of the 1984 Bhopal gas leak emerged in the social media landscape: (1) the night watchman at the UC plant, (2) the medical students who treated the survivors, and (3) the station master in Bhopal. News accounts tend to not highlight the stories of heroes and instead focus on the horrific stories of the victims. At the same time, protective actions (e.g., an evacuation procedure for those living near the plant, covering one's

[81] http://www.gingerchai.com/2010/06/17/survivor-story-bhopal-gas-tragedy/

face with a wet cloth, staying indoors, and walking not running in the opposite direction of the wind) that could have been communicated and implemented on the night of the gas leak now appear online and are being redistributed through social media channels. The presence of these protective actions in survivor accounts suggests that more effective risk communications are needed to inform populations vulnerable to similar types of chemical leaks and industrial accidents.

7.2.2 Witness Accounts in Wikipedia

One issue that arose in depicting the story of the Bhopal gas leak was whether eyewitness accounts are appropriate to include in Wikipedia articles. Although Wikipedia allows anyone to participate in the editing process, debates in the Discussion page often arise as Wikipedia editors negotiate what type of content should be included and how it should be presented. In an earlier version of the *Bhopal disaster* Wikipedia article, the following snippets appeared in the *Witness Accounts* section:

> *"It was about two o'clock (in the morning). I heard people shouting Bhago! Bhago! (Run! Run!) Nobody said why, they just asked us to run. It was smoky outside and smelt as if somebody was burning chillies. Our eyes were burning and we were finding it difficult to breath," recalls Lakshmi, now 55.*
>
> *"Everybody was running. Many fell down, but people stepped over them and ran. My husband had just got his salary, so we had money to take a train out of Bhopal. But at the railway station there was chaos. Trains weren't running and people were all over, coughing and vomiting. So we ran to the bus-stand, but there weren't any buses. So we ran back to the station and spent the night in a pit next to platform no. 5," she says. Huddled in the pit with the family, with faces covered in wet cloth, Lakshmi passed out.*

This Wikipedia article was created in November 2002 and the *Witness Accounts* section was added in January 2006, but it was removed 10 days later. In the Discussion page of this article, the Wikipedia editor who added this section justified his addition with the following response:

> *"All information we have originates from human observation. If there is consensus among several observations of the same thing, meta narratives can be created to summarize and generalize the observations from a detached viewpoint. Such meta narratives are supposed to be free from the influence of the original observer, but they too are composed by the same humans as the original observers; usually the closer to the original observation, the better. Still, I think that the neutral answer to the question whether eyewitness accounts are appropriate would be that they cannot stand in place of the encyclopedic meta narration ('objective description'), but they can serve the role of a 'textual picture', as long as they are true and representative. If you have a reason to believe that the eyewitness account by Mr. Ghosh is misleading, say so. Before inserting this eyewitness account, the article didn't answer the question what the disaster was really like for the victims or what made it different from e.g. Chernobyl disaster apart from the difference in name. By inserting the witness account, I did not remedy the need for encyclopedic description, I only augmented the information value of the article. I welcome you or anyone else to make the encyclopedic description, rather than just pressing delete button over my contribution."*

In response to this discussion, another Wikipedia editor wrote that he recognizes the value of personal accounts but argues that Wikipedia is "a place for facts" and suggests that the facts should at least appear first and the witness accounts afterward.

Encyclopedic environments typically do not include descriptive firsthand accounts; however, the justification for adding such accounts as presented here does point to its informational quality if it is complemented by other factual accounts. Although eyewitness accounts are not always factual or only provide a certain point of view, it is worth considering how aggregating and data mining a large set of witness accounts from an affected population could produce a more objective and factual set of meta-narratives by crowdsourcing and triangulating these accounts. The question then becomes whether crowdsourced and triangulated eyewitness accounts provide informational value worth sharing widely in a social media service like Wikipedia.

7.2.3 Visual Stories

Many survivor stories appear as photos and videos in documentaries and docudramas about the Bhopal gas leak uploaded onto Flickr, YouTube, and Vimeo. Vinod Sohanlal, who currently lives in Bhopal, is the administrator and creator of the *Lest we forget—Bhopal gas tragedy* Flickr group, the only Flickr group dedicated to the Bhopal disaster. After joining Flickr in 2008, he was "surprised" that no Flickr group existed yet to commemorate this "momentous event," especially since there were many Flickr groups on a multitude of subjects. After reading numerous blogs and articles related to the gas leak on the web, he felt that "the story of Bhopal could best be told through its pictures."

Photo essays and slideshow remixes narrated with interviews and affective background music are common ways to depict the stories of survivors. For example, Alex Masi, an award-winning documentary photographer and journalist, created a multimedia story[82] called *Open Wounds: Bhopal 1984-2009*. He weaves together photos he took of survivors in Bhopal with an interview with Dr. Sathyu Sarangi (who launched the Bhopal Medical Appeal in 1994 and established the Sambhavna Clinic in 1995) and then uses captions and emotional piano music as the thread for narrating his story about Bhopal. He uploads the video onto Vimeo and uploads photos onto Flickr. He then tags these photos with the word "bhopal" in Flickr and includes a long caption to textually depict the story being told of the person depicted in the photo. Figure 18 is a photo[83] of a 14-year-old boy born with physical disabilities. The caption of this Flickr photo explains how his mother, a gas survivor, has been "feeding underground red-colored water to her child since his birth." This water has been contaminated by Union Carbide's chemical waste for many decades, which is discussed in more detail in Section 7.4.2. Photos of children in Bhopal

[82] http://www.vimeo.com/7236918
[83] http://www.flickr.com/photos/alex_masi/4520206965

are visual reminders and representations of how this disaster continues to affect second- and third-generation children of Bhopal survivors and their families. The stories of these young Bhopali survivors illustrate the toxic legacy that they have inherited in the form of long-term health effects from chemical exposure, including birth defects, eye problems, respiratory difficulties, immune and neurological disorders, and female reproductive difficulties.

Many black-and-white photos taken immediately after the gas leak are also shared in Flickr, Facebook, and YouTube providing a visual window into the devastation that unfolded in 1984. For example, Figure 19 is a photo[84] depicting the thousands of deaths that occurred immediately after the gas leak. Rajesh Mistry took this photo but someone else uploaded it to Flickr. Many of Mistry's and Raghu Rai's professional black-and-white photos of the Bhopal tragedy are now uploaded and shared through social media services like Facebook and Flickr.

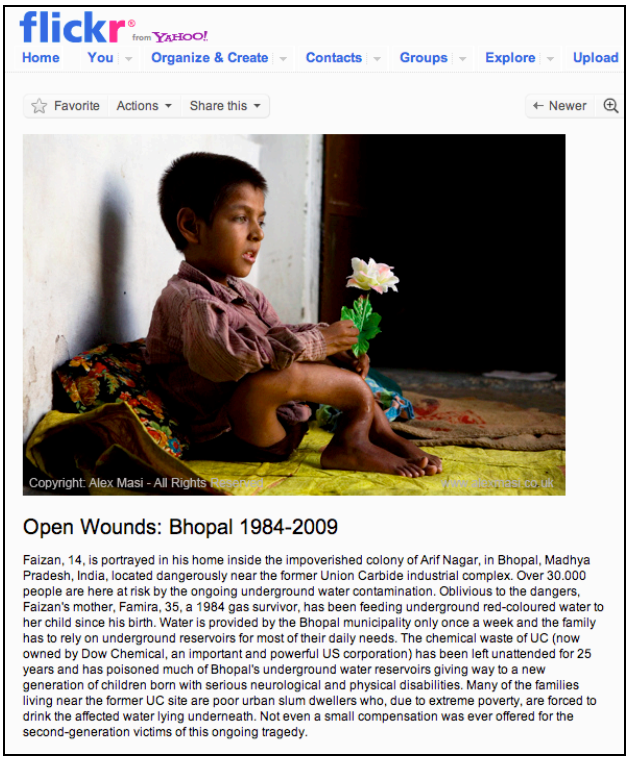

Figure 18: Flickr Photo from Open Wounds Documentary by Alex Masi (Photo Taken June 24, 2009)

[84] http://www.flickr.com/photos/kuruporissa/4699145142

Figure 19: Flickr Photo of Mass Casualties After the Gas Leak
(Photo Taken by Rajesh Mistry; Photo Uploaded by kurup_man on June 13, 2010)

One reason why these are the only photos being shared that document the emergency period of the Bhopal gas leak may be that professional photographers and photojournalists may have been the only ones who were able to document this tragedy, since cameras were not widely owned at the time in this region. Therefore, the sharing of these particular photos through social media channels is one way in which to preserve the visual memories of what many Bhopalis saw and experienced in the immediate aftermath of the gas leak.

Photos from the impact zone now repeatedly appear in different amateur and professional documentaries available on YouTube. For example, one of the highest viewed Bhopal-related documentaries on YouTube was produced by Strategic Video Productions[85] called *The Bhopal Chemical Disaster: Twenty Years Without Justice*. This documentary tells the complex story of the Bhopal chemical leak using these black-and-white photos taken in the aftermath of the gas

[85] http://strategicvideo.blogspot.com/2007/03/twenty-years-without-justice-bhopal.html

leak and interviews with Bhopali survivors, a US lawyer, and a former Union Carbide engineer describing what they experienced on that day, what led up to the gas leak, and what has happened since then. Similarly, Gaurav Bahuguna created his own short documentary as a "tribute to the people who lost their lives." He took clips from an existing documentary about the Bhopal disaster and a soundtrack from the movie *Munich* and then remixed them together using Windows Movie Maker to edit and compose his own amateur documentary entitled *Remembering Bhopal gas Disaster 1984*.[86] On July 12, 2009, he uploaded his video to YouTube and has since received 7,962 views and 14 comments.

It is through these visual documents that allow people a generation later to see what actually happened and is still happening to those affected by the Bhopal gas leak. In addition to the textual narratives shared by Bhopal survivors in Facebook and in blog posts, these visual survivor accounts attempt to make this disaster more real and perceptible to those who were not even aware of this disaster before. What these survivor stories have also illuminated is the ongoing disaster that continues to unfold not only in Bhopal but also in other parts of the world.

7.3 Beyond the Bhopal Gas Leak: The Ongoing Effects

Another type of narrative that appears in the social media landscape about the Bhopal gas leak is how the Bhopal disaster is an ongoing and unfinished crisis. For some families, the gas leak instantly killed three generations (i.e., grandparents, parents, and their children). For other Bhopalis, this disaster has also affected the lives of the younger generations, since many of the children of the gas-affected parents born after the disaster now suffer from long-term health effects. In the Discussion page of the *Bhopal disaster* Wikipedia article, one editor commented, "This article does not focus on the disaster itself but strays wildly from the subject at times.

[86] http://www.youtube.com/watch?v=hIfNDo3WpBg

Deeper research should be done by Wikipedia to focus on the actual disaster and its causes." However, some have argued that the Bhopal disaster story should not solely focus on what happened in 1984 but rather should include the warning signs, the long-term effects, and current events that relate to the Bhopal disaster.

In this section, I present examples of how people are using social media to illustrate the ongoing nature of the Bhopal disaster. First, I discuss how this occurs through word choice. In the second subsection, I explain the emergence of the "second disaster" regarding the water contamination in Bhopal. In the last subsection, I present narratives that discuss the lack of safety and corporate responsibility that created and prolonged the Bhopal disaster.

7.3.1 Word Choice

Although on August 20, 2010, the U.S. State Department declared that "legally the Bhopal gas case is closed," many would argue that the Bhopal disaster still continues and the fight to keep the memory of Bhopal alive persists in the social media landscape. Colin Toogood from the Bhopal Medical Appeal argues:

> *"The statement is simultaneously completely true and completely false, depending on the context. Yes, the civil case concerning the poisoning of people in Bhopal on the night of 2nd/3rd December is closed. But, the criminal case is very much alive and the US corporation and ex CEO Warren Anderson are fugitives from justice in India. Furthermore, there have never been any charges answered regarding the water contamination and there has never been any compensation paid nor any attempt at environmental remediation. This is the case that is pending in the US courts..."*

Toogood goes on to further point out:

> *"The interesting thing about social media is that it is giving campaigners and activists (however legitimate) a public voice. This creates, amongst other things, an opportunity to debunk any disinformation that might have accompanied a disaster situation — and we all know that disaster situations are usually explained through 'creatively worded information', at best, or even downright lies, as a means to limiting exposure to litigation."*

As previously mentioned in Section 7.1.1 and 7.1.3, Union Carbide carefully and creatively made their official statements about the Bhopal tragedy on their Bhopal.com Information Center website. The International Campaign for Justice in Bhopal created the spoof website at TheRealBhopal.com that creatively reworded Union Carbide's statements. Presented next are other examples of ways creative wording can be used in the social media landscape to communicate how the Bhopal disaster has not ended.

The way in which some Facebook users refer to the Bhopal disaster reflects the ongoing nature of this crisis. For example, Adil Laiq Ahmed, a Bhopali native born after the gas leak, refers to the Bhopal tragedy as an ongoing disaster in the titles he created for his Facebook group (*Bhopal GaS Tragedy [25,000+ dead and counting]*) and Facebook page (*The Unfinished Story of Bhopal 1984*). Similarly, Debosmita Nandy—a blogger who wrote a blog post called *Bhopal Verdict: A Nation Held Guilty*[87]—classifies the Bhopal tragedy as "a recent event and also as a timeless disaster whose effects people are still bearing." Another way people depict the ongoing nature of the Bhopal tragedy is using the phrase "Bhopal 1984 – ???" as shown in Figure 20. This image was uploaded to the *Students for Bhopal* Facebook group asking its members to use this image as their profile picture "to raise awareness about the ongoing deaths in Bhopal." These ongoing deaths are in part because of the "second disaster."

[87] http://debosmita.wordpress.com/2010/06/28/cover-story

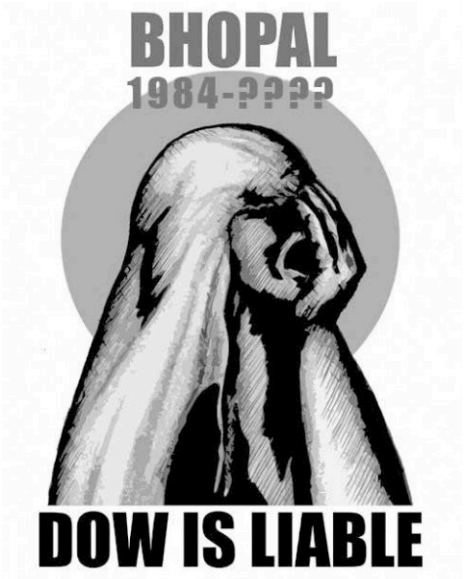

Figure 20: Image Uploaded to Students for Bhopal Facebook Group (Added/Uploaded by Aquene Freechild on October 19, 2007)

7.3.2 The "Second Disaster"

The "second disaster" refers to the ongoing contamination of the groundwater in Bhopal from the chemicals left at the Union Carbide pesticide plant. Nearly 25,000 Bhopali residents are using this groundwater for drinking, bathing, and other daily needs. This water contamination has been a slow onset crisis that began before the gas leak when Union Carbide disposed of the toxic chemicals in and around the pesticide plant since 1969 when the plant was first built. The attention around the 1984 gas leak as being the "worst industrial disaster," especially on the 20th and 25th anniversaries, has helped shed light on this hidden and forgotten disaster that continues to affect Bhopalis on a daily basis. According to Stringer and Johnston's (2002) report, the toxins are not only poisoning the soil, groundwater, and vegetables but also mothers' breast milk. This is why many argue that it was not just gas contamination but also water contamination that have affected the 2nd and 3rd generations. Therefore, the Bhopal disaster is an unfinished story that continues with the youngest Bhopali survivors being born today, according to Aquene Freechild, who works with Students for Bhopal.

Site cleanup after the gas leak was handed over multiple times. Since Union Carbide India Limited (UCIL) owned and operated the Bhopal plant, they began cleanup efforts under the direction of the Indian government. In 1994, the UCIL stock was sold and the company became Eveready Industries India Limited, which then led the cleanup efforts until 1998. Since Union Carbide is a subsidiary of the Dow Chemical Company, many believe that Dow acquired liabilities from the gas leak including remediation efforts. UCC states the following on their *Bhopal Information Center* website:

> *"There were no liabilities for Dow to inherit through Union Carbide on the Bhopal gas release. Dow acquired the shares of Union Carbide in 2001, more than a decade after Union Carbide settled its liabilities with the Indian government in 1989 by paying $470 million and seven years after UCIL became Eveready Industries India Limited. Dow never owned or operated the UCIL plant site."*

Additionally, in response to the June 7, 2010, Bhopal court decision, UCC further emphasized that "the Bhopal plant was detail designed, owned, operated and managed on a day-to-day basis by Union Carbide India Limited (UCIL) and its employees." In other words, Union Carbide does not believe they are subject to the jurisdiction of the Indian courts, since they were not involved with the operation of the plant at the time of the gas leak.

Union Carbide also repeatedly emphasized that the Madhya Pradesh State Government of India has control over the site and the remediation efforts. They also claim that the "Indian government authorities have publicly and repeatedly confirmed that no contamination of soil or groundwater outside the plant walls resulted from the gas leak." Although a 1997 report from India's National Environmental Engineering Research Institute (NEERI) found "soil contamination within the factory premises at three major areas that had been used as chemical disposal and treatment areas…the study found no evidence of groundwater contamination outside the plant and concluded that local water-wells were not affected by plant disposal

activities." Despite the origin of the contamination, the exposure to the Union Carbide chemicals during the gas leak and from the groundwater has resulted in serious long-term health effects not only for those directly exposed but also those indirectly exposed through childbirth.

The long-term health effects caused by chemical exposure from the Union Carbide pesticide plant are evident in posts that appear across different social media services. For instance, Bhavna Suri writes in the *Getting Involved* discussion thread[88] of the *Students for Bhopal* Facebook group:

> *"The horror still persists in the form of so many health conditions including respiratory disorders, malignancies, visual problems, menstrual, dermatological, neurological and psychiatric disorders (amongst many more) afflicting the community. Disabled children still abound."*

Similarly, the Twitter user @BhopalMedAppeal[89] tweeted in 2009 just before the 25th anniversary of the Bhopal disaster that "It's not history. People still suffer."

Some of the other ways in which social media users communicate the ongoing suffering from the Bhopal disaster is by providing statistics. In response to the second highest viewed YouTube video[90] called *bhopal gas tragedy*, one of the 152 comments to this video states:

> *"What facts do you want? 10,000 immediate deaths or the 30,000 who have died since then or the broken down rate of 15-20 MIC deaths per month or the 390 tonnes of remaining MIC that's left by Carbide as a gift for the future generation of bhopalis?"*

Similarly, the caption that appears near the end of Gaurav Bahuguna's *Remembering Bhopal gas Disaster 1984* YouTube video mentioned in Section 7.2.3 states:

> *"Although it has been 25 years since the disaster, approximately 10-30 people continue to die every month in Bhopal from toxic exposure and another 150,000 people continue to suffer long-term health consequences from the disaster."*

[88] http://www.facebook.com/topic.php?uid=2206855545&topic=1604
[89] http://twitter.com/BhopalMedAppeal/status/5675501359
[90] http://www.youtube.com/watch?v=rmtN8NkMcmo

Despite the differences in ranges of these statistics, they all attempt to communicate how the impact of this pesticide plant has affected Bhopalis on a massive scale not just in 1984 but over time. Debosmita Nandy articulates this ongoing aspect of the Bhopal disaster with the following quote from her *Bhopal Verdict: A Nation Held Guilty*[91] blog post:

> *"For many of us, breaking news last a day or two and if we happen to be a part of it, then for a few years or may be a lifetime. But for many in the city of Bhopal, the breaking news of gas leakage on the eve of December 3, 1984 will haunt for generations to come."*

While many Bhopalis face the ongoing effects of the Bhopal disaster on a daily basis, these survivors and many of their supporters worldwide are using the solidarity around this crisis as an opportunity to move toward disaster mitigation by discussing the lack of safety and corporate responsibility issues that ultimately created and prolonged this disaster.

7.3.3 No More Bhopals: Corporate and Government Negligence/Responsibility

Disaster mitigation entails preventing the probability of a disaster occurrence and/or reducing the effects of unavoidable disasters. In the case of the Bhopal disaster, many Bhopali activists and supporters of their social justice movement that I interviewed emphasized that "we all live in Bhopal, we are all at risk" because this could happen again as we increasingly live in a more industrialized and chemical-based society. Bhopali survivors use the slogan "No More Bhopals" to encourage people to learn from what happened and is still happening in Bhopal and to encourage people to join the larger movement around chemical safety. This slogan often appears on banners at demonstrations and at candlelit vigils (Figure 21), which are then shared through photographs uploaded to Facebook and Flickr. Similarly, a music video[92] called *No More Bhopals* was uploaded to YouTube with the following lyrics: "A thousand Bhopals waiting to

[91] http://debosmita.wordpress.com/2010/06/28/cover-story
[92] http://www.youtube.com/watch?v=CHW_wrQE1_A

happen…No more Bhopals…We can change it if we really want to." Therefore, this slogan attempts to promote a long-term and future-oriented perspective of the Bhopal disaster by encouraging people to learn about how this type of disaster is preventable.

Figure 21: No More Bhopals Picture as Profile Picture for the Bhopal GaS Tragedy [25,000+ dead and counting] Facebook Group (Added by Adil Laiq Ahmed)

According to Shana Blustein Ortman, an admin for the *Students for Bhopal* Facebook group, Bhopalis recognize that the Bhopal disaster and their direct action efforts in response to this disaster are "setting a precedent with regards to safety and liability" for other communities that may be similarly affected. The memory of chemical safety issues related to the Bhopal gas leak was brought to life again when an explosion occurred at Union Carbide's "sister plant" in 2008, which is discussed in the next paragraph. The memory of liability issues related to the Bhopal disaster was also brought to life more recently in response to the 2010 British Petroleum (BP) oil spill. Such patterns of commemoration around the Bhopal tragedy explain how the memory of the Bhopal disaster stays alive when they are linked to similar disasters that occur in the present day and when there is the possibility of it occurring in the future.

The Bayer CropScience Plant in Institute, West Virginia, in the United States is often referred to as Union Carbide's "sister plant." Union Carbide originally owned this plant in West

Virginia. The Bhopal plant was built based on the design of this plant. That is why it is considered the "sister plant" and especially because it also produces and stores methylisocyanate (MIC), the same chemical in the Bhopal plant. The following comment appears in the second highest viewed YouTube video about the Bhopal gas tragedy:

> *"If you can't imagine this happening in the US think again, it almost did. A fatal explosion occurred on August 28, 2008 in Institute, West Virginia at the Bayer CropScience Chemical plant. This deadly explosion could have easily eclipsed Bhopal India. Bayer CropScience is the only chemical plant in the World that makes and stores enough MIC daily that can cause this kind of mass holocaust."*

This explosion reenergized the justice for Bhopal movement because it was an opportunity to show the significance of this past disaster to current crises. According to Ortman, Bhopali survivors created a stronger connection not only to the community affected by the explosion at the sister plant but also to other communities similarly affected by industrial hazards and chemical safety issues. As the Bhopali survivors continue to strengthen these connections by visiting these affected communities around the world and making virtual connections online, they see "their struggle as a global struggle." In addition to the safety concerns arising from industrial chemical plants, liability and specifically corporate responsibility are becoming an increasing issue with recent disasters like the Deepwater Horizon/BP oil spill.

In response to the 2010 Deepwater Horizon explosion and the resulting BP oil spill, people started to reference the Bhopal disaster in juxtaposition to the BP oil spill with respect to corporate responsibility issues. A link between the Bhopal disaster and the BP oil spill was made when US President Barack Obama stated that the US government will hold BP accountable for cleaning up the oil and compensating the people affected by this crisis. Some raised the question as to whether the BP oil spill revealed a double standard when put in contrast to the response to the Bhopal gas leak.

The image in Figure 22 is one screenshot from a TV news report by Suhasini Halder, a Foreign Affairs Editor for CNN-IBNLive. The transcript of this news reports appears as a news article[93] entitled "US nails BP for oil spill, ignores Bhopal." The text of this news report was copied and pasted into a blog post[94] with a link to this original article. In the TV news video of this report, it presents a series of visual juxtapositions to accompany their explanation of "The American Double Standard," as shown in Figure 23. The following is the final statement made by Halder in her report:

> *Whether it's the Bhopal gas tragedy or the oil spill, the US government is being accused of protecting its own interests. But it's the Indian government that must answer why it allowed the US those actions - letting Anderson go, agreeing to a paltry settlement for the victims, and for letting the toxic wastes at the Carbide factory lie there for 26 years.*

Although much of the attention brought by juxtaposing the Bhopal gas leak with the BP oil spill tends to focus on corporate responsibility, Halder's final statement is a reminder that the Indian government also bears much of the responsibility for the lack of justice and remediation efforts in Bhopal. Over 3,400 other blog posts also juxtapose the Bhopal gas leak with the BP oil spill; I presented this blog post in part to show an example of how news reports are often cross-posted in the blogosphere by bloggers to aggregate and archive these reports that tend to disappear once it is no longer considered news in the mainstream media.

[93] http://ibnlive.in.com/news/us-nails-bp-for-oil-spill-ignores-bhopal/124596-2.html
[94] http://palashbiswaslive.blogspot.com/2010/06/carbide-plant-saw-3-mishaps-before-gas.html

Figure 22: Bhopal Gas Leak versus the BP Oil Spill Image (Posted on June 17, 2010, at IBNLive Website)

Figure 23: The American Double Standard: Juxtaposition Between BP Oil Spill and Bhopal Gas Tragedy (Aired on June 17, 2010, at IBNLive)

There were other ways in which these disasters were juxtaposed. The following two posts appeared on the wall of the *Students for Bhopal* Facebook group:

> *"Funny how Americans are calling for action against BP when an American company Union Carbide/Dow Chemical caused the worst chemical disaster the world has seen, destroying not shrimps or livelihoods but thousands of lives and continue to deny any responsibility!" – Steve Johnson*
>
> *"Just a heartfelt thought on the injustice of Bhopal. USA are having a ecological crisis with the oil leak, a terrible event. Barack Obama & his party are holding BP accountable for the clean up & compensation to the people who are suffering. Probably because USA is a major economic, major political power, the President cares & the people involved are not corruptable, action is being taken. I am amazed at the difference in the actions taken by political leaders in India. Why have the Govt not forced people/business/politicians to be held accountable? Why is the government or the Bhopal lawyers not lobbying internationally for a morally just resolution to this awful tragedy? I wonder if Barack Obama or the UN would listen if lobbied? The Union Carbide negligence & greed in Bhopal is simply disgraceful & a slur on humanity." – Harjeet Kaur*

Yet, another Facebook user posted the following on the wall of the *Bhopal GaS Tragedy [25,000+ dead and counting]* Facebook group:

> *"Fali Nariman says the Bhopal gas leak case can't be reopened????? In USA with an oil leak Obama asks BP to pay 20$ Billion where hardly any humans have died. What is the compensation 0f $470 million where thousands have died & thousands are still suffering... I can understand his law point of view.....but where is the Humane side....that too bein an Indian... sad state of affairs." – Filly Bapuna*

The occurrence of the BP oil spill, the worst oil spill in US history, became an opportunity to discuss corporate liability and responsibility issues regarding industrial accidents and technological hazards. At the same time, the oil spill helped to revive the unresolved liability issues regarding the Bhopal gas leak and subsequently the second disaster regarding water contamination. The role the US played in both disasters was reversed; the US was the alleged perpetrator in the case of Bhopal since Union Carbide was a US corporation, whereas US coastal communities became the victims of the BP oil spill. Both disasters raised fundamental questions

about corporate liability issues that have resulted in difficulties with fighting for justice since these disasters were caused by multinational corporations and occurred under two jurisdictions.

Both disasters as well as the passing of the 2010 Nuclear Liability Bill in India reignited the issue of what the value of a human life is to corporations in legal terms. The Nuclear Liability Bill was passed in August 2010. Before it was passed, discussions arose as to how this bill should consider the corporate liability issues in the aftermath of the Bhopal gas leak. For example, in a blog post titled *Bhopal Gas tragedy, a lesson for Nuclear Liability Bill*,[95] Hemlata Aithani stated in June 2010:

> *"The recent verdict on the world's worst industrial disaster, Bhopal gas leak tragedy, which handed out a meager penalty to the convicts, is casting a shadow on the American hope of the Civil Nuclear Liability Bill from being passed in Indian Parliament…The absence of stringent laws in the country enabled former Union Carbide Company escape criminal liability after the gas leak on December 2-3 1984 killed thousands of lives immediately and in years to follow. Activists fear the same absence of criminal liability in the bill will let suppliers of nuclear technology and equipment in the US go scratch free in case of a nuclear disaster which would be much bigger and dangerous than the gas leak tragedy."*

The following tweets related to this issue appeared in Twitter during the 26th anniversary of the Bhopal disaster in 2010:

> *"NY Times spotlights Obama's historical tin ear on Bhopal and Indian disdain for current US nuclear liability demands http://nyti.ms/aUS9vS" – @NuclearPolicy*
>
> *"Legislation: Nuclear Liability Bill: It is no iron-clad legislation to prevent another Bhopal. http://bit.ly/cPpyGb" – @frontline_india*

The Nuclear Liability Bill revived discussions of compensation and justice, or lack thereof, in the aftermath of the Bhopal gas leak. Debates occurred as to how these legal mandates have put a price on human life and possibly the wrong or inadequate price. The link that was made between

[95] http://hemlata-aithani.blogspot.com/2010/06/bhopal-gas-tragedy-lesson-for-nuclear.html

the Bhopal disaster and the Nuclear Liability Bill indicates that public policy is a critical aspect to facilitating disaster mitigation that needs to be considered more deeply.

Last, one finding that emerged in analyzing Bhopal disaster Twitter dataset was the connection people made to a recent disaster that occurred in Ajka, Hungary. On October 4, 2010, a dam holding a huge reservoir of toxic sludge from the Ajka alumina plant collapsed, causing a flood of the red liquid waste to inundate nearby settlements like Kolontár. Some Twitter users mentioned this recent industrial accident during the 26th anniversary of the Bhopal disaster and making links between this disaster and historic technological hazards like the Bhopal gas leak and the Chernobyl accident. The following is a sample of tweets that linked Bhopal with Chernobyl and the recent disaster in Kolontár, Hungary:

> *"A deadly deluge LIKE Chernobyl and Bhopal, Kolontar never wanted to be on the map. Not like this, http://migre.me/1w9Ym" – @maumeyer*
>
> *"The name of this town may soon join 'Bhopal' and 'Chernobyl' as symbols of man-made disasters. http://n.pr/b2zpZj #chilling" – @Noleli*
>
> *"Classic article 'We All Live in Bhopal' http://theanarchistlibrary.org/HTML/David_Watson__We_All_Live_in_Bhopal.html #floods #toxic #Hungary" – @Skaerbrant*

As the justice movement for Bhopal continues their fight with the slogan "No More Bhopals," people in the social media landscape also continue to remind us how "we all live in Bhopal" as more industrial accidents take place as a result of our chemical-based culture.

As many in the social media landscape create links between Bhopal and more recent crises and draw attention to the second disaster in Bhopal amidst the long-term health effects of the gas leak, the credibility of these claims become an important issue. Scientific reports have become one source of legitimating these claims and communicating these ongoing narratives.

7.4 Bhopal Disaster Research and Articles from Scientific Sources

Scientific narratives regarding the Bhopal gas leak also appear in the social media landscape in the form of scientific publications. The Bhopal tragedy is a chemical incident that resulted in a myriad of research studies and reference materials; I discuss a few of them here. Chemical engineers conducted multiple investigations to determine the cause of the gas leak, and medical studies of the gas survivors were conducted to determine the long-term health effects of the MIC gas exposure. To determine if the groundwater was still contaminated by Union Carbide chemicals, water and soil tests were taken in 1989 by Union Carbide, in 1991 and 1996 by the Madhya Pradesh Public Health Engineering Department's State Research Laboratory, in 1999 and 2009 by Greenpeace Research Laboratories, in 2009 by the Bhopal Medical Appeal, and in 2009 by the Centre for Science and Environment in New Delhi, India. These types of documents produced from studies with scientific rigor are typically shared via social media to include a narrative with a more objective stance.

In this subsection, I explain how and where scientific documents about the Bhopal disaster are shared online through social media. First, I explain how advocacy groups reference journal articles and/or generate scientific reports. Then, I present examples of where such research reports are referenced within particular social media sites. Last, I explain the integration of scientific reports in the *Bhopal disaster* Wikipedia article.

7.4.1 Referencing Research and Generating Reports

Some Bhopal-related advocacy groups tend to reference journal articles to provide scientific evidence for legitimating their demands for direct action. For example, some advocacy groups conduct their own research studies and promote them via social media. For example, the Bhopal Medical Appeal is a UK charity that funds the Sambhavna Trust Clinic in Bhopal, the

only facility providing free healthcare services to survivors of the 1984 gas leak and those affected by the ongoing water contamination around the Union Carbide plant. They joined Twitter in April 2009 and Facebook in November 2009. In October 2009, the Bhopal Medical Appeal published a 66-page report[96] entitled *Analysis of chemical contaminants in groundwater and assessment of the qualitative and quantitative drinking water supply situation in the communities surrounding Union Carbide India Ltd. (UCIL) plant site in Bhopal*. They used Twitter and Facebook to promote this report and included links to news articles that cited this report. For example, they used their @BhopalMedAppeal Twitter account and tweeted:

> *"Hot Off The Press - New Bhopal Water Report: shows poisoning levels of toxins in drinking water #Bhopal25 http://tinyurl.com/yejcvgv."*

Although this report was published in October 2009, they promoted it through Twitter and Facebook during the 25th anniversary of the Bhopal gas leak. Similarly, the *New York Times* published a news article[97] during the anniversary called "Poisoned Water Haunts Bhopal 25 Years After Deadly Accident—Report" that discussed the findings from this report. Then, the @BhopalMedAppeal shared a link to this *New York Times* article using Twitter that same day in an effort to demonstrate the legitimacy of their report.

Having the ability to easily publish an extensive scientific report online has been an important aspect to giving the wider public and advocacy organizations like the Bhopal Medical Appeal not only a voice but also a chance to show how they can make legitimate claims that could potentially stand louder than what is "officially" claimed by the accuser, in this case Union Carbide, Dow Chemical, and the Indian government. Colin Toogood, from the Bhopal Medical Appeal, emphasizes that unlike Union Carbide's statements on their Bhopal.com site, they as

[96] http://www.bhopal.org/wp-content/uploads/2010/11/2009-BMA-Sambhavna-Bhopal-Water-Report.pdf
[97] http://www.nytimes.com/gwire/2009/12/01/01greenwire-poisoned-water-haunts-bhopal-25-years-after-de-59549.html

campaign organizers can back up everything they state where it can stand in a court of law. He goes on to explain:

> *But, we are almost never able to get this sort of information printed, in the traditional media, and this is where the power of social media really lies for us. My point being that we are our online publishers. We stand by what we say—'publish and be damned'?! The more connected we are, through the means of social media, then the more people we can reach and the more we usurp the power of the Dow/UC PR machine as their power lies mostly in the traditional media.*

What is beginning to occur is the cross-posting or cross-pollination between traditional and social media. Although it was initially more common to see social media users posting content from traditional media in their social media stream, we are also now seeing traditional media using content from social media in their reporting. In the case of these scientific reports conducted by advocacy organizations, they are increasingly being legitimated as vetted and reputable documents when they are referenced by mainstream news media and subsequently by social media users who link to these news articles.

Greenpeace Research Laboratories also published a series of Bhopal disaster reports[98] publicly available online. A 111-page report[99] entitled *The Bhopal Legacy: Toxic contaminants at the former Union Carbide factory site, Bhopal, India: 15 years after the Bhopal accident* was published in 1999. Other advocacy organizations as well as journalists from mainstream news outlets have cited this report by presenting its findings within news articles and sharing a link to the PDF version of this report using social media services. The Students for Bhopal organization also reference their 2002 95-page report[100] entitled *Chemical Stockpiles at Union Carbide in Bhopal: An Investigation*. In the Students for Bhopal website,[101] they explain how this report

[98] http://www.greenpeace.org/international/campaigns/toxics/toxic-hotspots
[99] http://www.greenpeace.org/international/PageFiles/24481/bhopal.pdf
[100] http://www.greenpeace.org/international/PageFiles/24481/Bhopalstockpiles.pdf
[101] http://www.studentsforbhopal.org/learn

documents "the presence of chloroform, lead, mercury and a series of other chemicals in the breast milk of nursing women who live near the factory," which is used to justify their claims of how Union Carbide is "still killing innocent people in Bhopal."

In an interview with Vinod Sohanlal, the administrator for the *Lest we forget- Bhopal gas tragedy* Flickr Group, he replies to my questions using snippets from recent online news articles that mention the 1999 and 2009 tests conducted by Greenpeace Research Laboratories. He first states:

> *"I expected that the event which has had an impact on the collective conscience of the world no less than the Minamata mercury poisoning, would help draw attention to the plight of the people who even after 25 years are still to get justice."*

He then quotes the "25 yrs on: Bhopal tragedy is still a national scandal" news article[102] in the *Deccan Herald*, which mentions how the 1999 Greenpeace report "found carbon tetrachloride in one of the handpumps at levels 682 times higher than US Environmental Protection Agency (EPA) limits. People drank this water, bathed and washed their clothes in it." He then shares a snippet from the *Guardian* news article[103] entitled "Bhopal: 25 years of poison," which stated that "in August 2009, a sample of water from the same hand pump was analyzed by a Greenpeace laboratory in the UK. Carbon tetrachloride was found at 4,880 times the EPA limit. In the last decade, the water has become seven times more poisonous" (emphasis added by Sohanlal). Many bloggers have also referenced these Greenpeace reports in posts regarding the Bhopal gas tragedy and the ongoing disaster of water contamination.

As one final example, the *Students for Bhopal* Facebook group Info page states, "a recent study in the *Journal of the American Medical Association (JAMA)* confirmed that the children of

[102] http://www.deccanherald.com/content/39504/25-yrs-bhopal-tragedy-still.html
[103] http://www.guardian.co.uk/environment/2009/dec/04/bhopal-25-years-indra-sinha

gas-affected parents are themselves afflicted by Carbide's poison." Here they reference Ranjan et al.'s (2003) article entitled "Methylisocyanate exposure and growth patterns of adolescents in Bhopal" to prove that exposure to the gas leak in 1984 did in fact create long-term health effects affecting the younger generation in Bhopal. However, as Ingrid Eckerman points out in an email interview, "This is not a scientific article – it is just a letter to JAMA, and it suggests something but does not prove it. It is a very small study with limitations." Her comment suggests that it might be easy to reference articles that sound scientific to prove a point; however, such a citation may need further qualification to strengthen the argument for using such articles for advocacy purposes. In some ways, this raises the question as to whether or not the references in Wikipedia articles have been verified to make the Wikipedia articles reputable and accurate, which is discussed in Section 7.4.3.

The presence and awareness of scientific reports and research articles in the social media landscape is increasing in part because advocacy organizations and concerned citizens share links to news articles that reference these reports, and they also mention these reports to their social networks. This type of cross-posting is an important aspect of how scientific studies and news reports are shared in socially-distributed ways.

7.4.2 Visualizing and Bookmarking References

Links to scientific reports and journal articles are also appearing in social media services like Flickr and Delicious. For example, one Flickr user chose to upload 10 black-and-white photos taken by Raghu Rai in the aftermath of the Bhopal tragedy with captions using the text written by Greenpeace as the captions for each of these photos. One black-and-white photo[104] (Figure 24) documents the "sacks full of skulls…discarded after research at the Hamidia

[104] http://www.flickr.com/photos/31961227@N02/2988940129

Hospital." This research was conducted because "medical experts believe that the Methyl Isocyanate (MIC) gas inhaled by the people of Bhopal may have affected the brain." Although this Flickr user did not create the photo or the text in the caption, the act of sharing this content through social media channels was one way in which to communicate the type of research activity that took place after the Bhopal gas leak.

Figure 24: A Photo that References Medical Research Related to the Bhopal Gas Leak

Another example of a scientific report referenced in Flickr is an article called "Born Into Hell" written by the Center for Science and Environment in New Delhi, India. The article is a cover story for the *Down to Earth* magazine published by the Society for Environmental Communications in India. The cover image of the magazine is uploaded to Flickr[105] by the photojournalist Sayantan Bera, who titles this photo *born into hell @ down to earth* (Figure 25). The caption reads:

[105] http://www.flickr.com/photos/bsayantan/4159838033

> *"25 years after the gas leak, another tragedy is unfolding in Bhopal, Madhya Pradesh. Recent lab tests reveal that water and soil in and around the Union Carbide factory are loaded with pesticides. People living around the factory are forced to drink highly toxic water for 25 years, leeching from the poisons left inside the abandoned plant. With a reckless chemical giant (DOW) and a callous state, future generations will continue to drink the same water."*

The photographer also uploads another image from the Bhopal cover story in the comments section of the Flickr photo (Figure 26). This image includes four bullet points with information of the main findings in this report. What these photos in Flickr illustrate is how images are used to visually reference scientific reports through multimedia sharing services like Flickr.

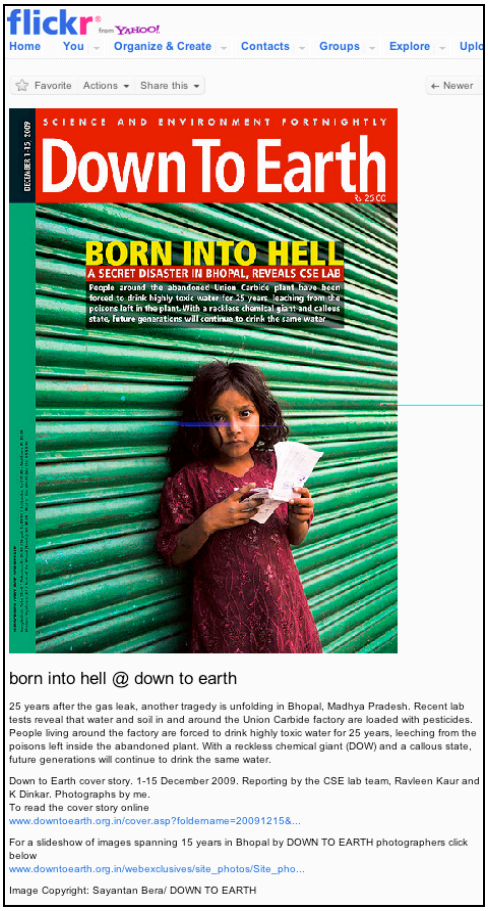

Figure 25: Flickr Photo of Born Into Hell Article (Photo Taken/Uploaded by Sayantan Bera on November 28, 2009)

Figure 26: Image of Born Into Hell Article in the Comments Section (Uploaded by Sayantan Bera in December 2009)

In Delicious, at least three scientific articles are bookmarked with the tag "Bhopal." For example, the Bhopal Medical Appeal report was uploaded to the India Environment Portal website[106] and then bookmarked in Delicious. A journal article by Broughton (2005) entitled "The Bhopal disaster and its aftermath: A review" was published in *Environmental Health: A Global Access Science Source* and bookmarked twice in Delicious; one Delicious user bookmarks the article that appears on the *Environmental Health* website[107] while another user bookmarks the same article that appears on the National Center for Biotechnology Information website's BioMed Central[108] section. This article provides a historical overview of the Bhopal disaster and includes a section on lessons learned and what has happened since 1984. The third scientific paper[109] that is bookmarked in Delicious is by Patwardhan and Bardhan (2004) entitled "The Bhopal Carbide Disaster: A Case Study in Crisis Communication," presented at the International Communication Association, which discusses Union Carbide's handling of crisis communication at global and local levels following the Bhopal gas leak.

Social media services like Delicious, Flickr, Facebook, and Twitter have the potential to increase the accessibility of relevant scientific reports that would otherwise be hidden in academic publication venues and online journal databases. The act of social media users sharing links to these reports is a way of recommending and promoting articles that would otherwise be difficult to find for people who are not academics or scientists regularly exposed to this type of material. Still, the problem is not so much an issue of accessing these scholarly reports but rather understanding the findings.

[106] http://www.indiaenvironmentportal.org.in/category/publisher/bhopal-medical-appeal
[107] http://www.ehjournal.net/content/4/1/6/
[108] http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1142333
[109] http://www.allacademic.com/meta/p_mla_apa_research_citation/1/1/2/4/7/p112473_index.html

7.4.3 References in Wikipedia and the Rise of the Indian Barnstar

Wikipedia is one of the most pervasive go-to sources for finding basic information about a topic like the Bhopal disaster, since Wikipedia articles often appear as the first search result in Google. Researchers have already started to study how accurate and trustworthy Wikipedia articles are by employing a variety of quantitative and qualitative methods to measure their quality, especially in comparison to gold standards like the *Encyclopædia Britannica* (e.g., De la Calzada and Dekhtyar, 2010; Giles, 2005; Luyt and Tan, 2010).

Through a word count comparison, the "Bhopal disaster" article in *Britannica*[110] contains 275 words, whereas the *Bhopal disaster* article in Wikipedia contains approximately 10,000 words. Additionally, the Wikipedia article contains 77 citations, one of the most important aspects of making a Wikipedia article credible. Currently the *Britannica* article states that investigations indicate the cause of this catastrophe was due to "substandard operating and safety procedures at the understaffed plant." The "Bhopal disaster" article also mentions:

> *"In the early 21st century more than 400 tons of industrial waste were still present on the site. Neither Dow Chemical Company, which bought out the Union Carbide Corporation in 2001, nor the Indian government had properly cleaned the site. Soil and water contamination in the area was blamed for chronic health problems and high instances of birth defects in the area's inhabitants."*

The encyclopedic article goes on to mention current events related to the Bhopal disaster, such as the Nuclear Liability Bill and the Indian court's verdict in June 2010 convicting eight former executives of Union Carbide's India subsidiary with a two-year sentence. *Britannica* has made updates to their online version of this article by including relevant current events, but it does not provide the extensive amount of content and resources that appear in the Wikipedia article. Such updates are evident in the total amount of edits for that month (Figure 27).

[110] http://www.britannica.com/EBchecked/topic/1257131/Bhopal-disaster

In Section 7.1.2, I explained how Dr. Eckerman created the largest number of edits to the Wikipedia article and included links to many different resources including her *Bhopal Saga* book, which synthesizes around 200 sources. Her medical and scientific expertise on the Bhopal disaster made her edits credible. The structure and scientific findings she provided in the Wikipedia article improved the article by presenting the complex details of this tragedy. In January 2009, she was awarded *The Indian Barnstar of National Merit* in recognition of her efforts to improve the Bhopal disaster article (Figure 28). "Wiki barnstars" are rewards given to Wikipedia contributors to show appreciation for a Wikipedia editor's "hard work and due diligence" and, in this case, for her editing work (Kriplean et al., 2008). Through her dedication to help the Bhopali survivors and to use scientific knowledge to explain the Bhopal disaster, she became an ad hoc historian providing the expertise needed to contribute accurate information to this Wikipedia article.

Month	# of edits	IPs	Minor	Graph — IPs — Minor — All edits
1/2010	16	6 (37.50%)	8 (50.00%)	
2/2010	31	18 (58.06%)	8 (25.81%)	
3/2010	27	7 (25.93%)	12 (44.44%)	
4/2010	19	5 (26.32%)	9 (47.37%)	
5/2010	33	13 (39.39%)	4 (12.12%)	
6/2010	254	95 (37.40%)	60 (23.62%)	
7/2010	68	25 (36.76%)	21 (30.88%)	
8/2010	83	11 (13.25%)	34 (40.96%)	
9/2010	35	8 (22.86%)	18 (51.43%)	
10/2010	38	8 (21.05%)	12 (31.58%)	
11/2010	53	19 (35.85%)	22 (41.51%)	
12/2010	24	8 (33.33%)	12 (50.00%)	

Figure 27: Number of Edits by Month for Bhopal Disaster Wikipedia Article in 2010 (source Soxred93)[111]

[111] http://toolserver.org/~soxred93/articleinfo/index.php?article=Bhopal_disaster&lang=en&wiki=wikipedia

Figure 28: Wiki Barnstar for Ingrid Eckerman on Bhopal disaster Wikipedia Article Posted January 17, 2009

As Wikipedia increasingly becomes a widely used resource to understand historical phenomena, it is Wikipedia editors like Dr. Eckerman that are shaping the digital heritage of the Bhopal disaster through Wikipedia edits. One might argue that some of these scientific endeavors that pertain to the Bhopal disaster are a form of action research that are intended to make broader impacts. In the next section, I present examples of sociopolitical forms of direct action that have emerged around the Bhopal disaster in the social media landscape.

7.5 Direct Action Onsite, Online, and Through Deception

The last type of narrative appearing in the social media landscape is the stories of direct actions taking place worldwide to fight for justice in Bhopal. Before the arrival of the Internet, direct actions were taking place on the streets of Bhopal and across India by the survivors themselves fighting for their own justice after the gas leak. In an interview with Aquene Freechild, the top recruiter for the *Campaign for Justice in Bhopal* Facebook cause, she shared that she hopes people will remember that the women, children, and poor people of Bhopal were primarily the ones who led the very powerful globalized movement that is seen today. Freechild believes that it was their grassroots efforts and the many victories that followed that set a precedent as one of the first globalized movements led by people from the ground. Similarly, in an interview with Vinod Sohanlal, who lives in Bhopal and created the *Lest we forget – Bhopal gas tragedy* Flickr group, he emphasizes, "it is the efforts of common people which keeps the issue in the public eye. Left to the governments and the corporates, and the symbiotic relations

they enjoy, the issue would have been buried long ago." The very act of keeping the memory of the Bhopal disaster alive is a subtle form of direct action that is a critical part of maintaining the living heritage of the Bhopal tragedy. What I argue is that social media services are beginning to accelerate the preservation of these memories in socially-distributed ways as well as facilitate news forms of direct action.

In the following subsections, I first discuss how social media is being used to document direct actions taking place on the ground. Then, I discuss the use of social media to facilitate distributed forms of direct action. Last, I present an example of direct action through deception that became widely distributed and discussed via social media.

7.5.1 Documenting Direct Actions Taking Place on the Ground

People are documenting the following direct actions taking place in Bhopal: commemorative events during the anniversaries; Padyatras (a long walk with a social purpose) from Bhopal to the central government in New Delhi, India; fasts and hunger strikes; candlelit vigils; Dharnas (sit-in protests); street demonstrations; and torch parades where effigies are set on fire. Such documentations of these direct actions increasingly appear in social media services like Facebook, Flickr, and YouTube.

In June 2008, a Flickr user shared a photo of Bhopal padyatris (Foot walkers), who marched from Bhopal to the Jantar Mantar in Central New Delhi to meet with the Prime Minister. After 70 days with no response from the government, nine Bhopal gas survivors launched a fast that was broken after 21 days when the government handed over a written commitment to the Bhopal-New Delhi Padyatra, meeting some of their demands (e.g., medical care, jobs and pension, cleanup of poisons, safe drinking water, action against criminal corporations, extradite Union Carbide, stop sale of Carbide's technology, make Dow Chemical

clean up the waste). The Flickr photo[112] in Figure 29 uploaded by Ramesh Lalwani captures day 16 of the fast. In the caption, it states, "Padyatris (Foot walkers) from Bhopal to Delhi are on fast Lady on laptop here is updating…Latest information can be seen at www.bhopal.net." Flickr photos are sometimes used as an alterative outlet for receiving news about localized events that may not be widely reported in mainstream media outlets. One of the comments of this Flickr photo states, "important post. not shown on american media. Eventually people will pay attention." Using social technology to freely and openly share news about local events is allowing a new form of social remembering to take place beyond the confines of corporate media and headline news reports.

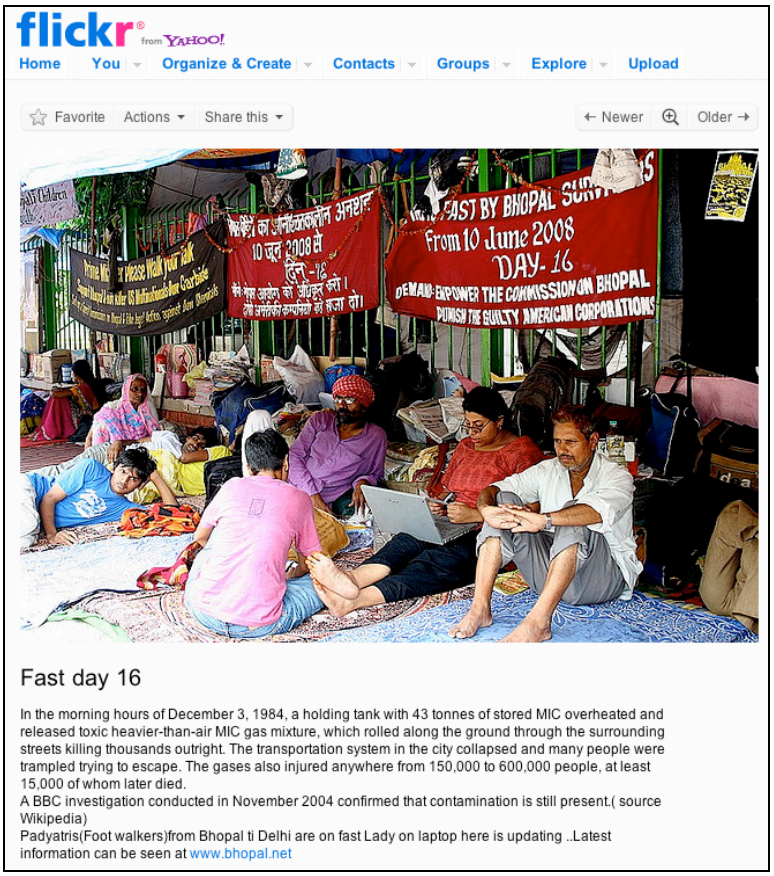

Figure 29: Flickr Photo of Bhopal Padyatras Taken and Uploaded by Ramesh Lalwani on June 25, 2008

[112] http://www.flickr.com/photos/ramesh_lalwani/2612790781/in/pool-784632@N21

Burning effigies of government officials or corporate executives has become a tradition among Bhopali survivors for visualizing their political actions and statements. These public acts are documented through photos and videos, which are then uploaded to Facebook, Flickr, and YouTube. The photo in Figure 30 was shared in the *Bhopal GaS Tragedy [25,000+ dead and counting]* Facebook group[113] and contains the following caption: "Survivors hold an effigy of Anderson during a demonstration in Bhopal in Madhya Pradesh on 31 July 2009." Sanjeev Gupta, a photojournalist for the European Press Photo Agency, took this photo. Many of the photos that appear in the Bhopal-related Facebook and Flickr groups are taken by professional photographers and appear in online news articles. Then, many social media users save these photos from online websites and share them in Facebook and Flickr.

Figure 30: Facebook Group Photo of a Warren Anderson Effigy
(Taken by Sanjeev Gupta/EPA on July 31, 2009; Added by Adil Laiq Ahmed on December 3, 2009)

[113] http://www.facebook.com/photo.php?fbid=196000001462&set=o.128430523290&pid=3568925&id=697061462

Mythologies of corporate power, humor, and public ridicule are often used in conjunction with these effigies during campaigns that urge the public to participate in direct actions. For example, a YouTube video[114] called *Bhopal Rally – We Will Not Take TATA salt* films a rally in January 2007. It records a campaign against the 'House of Tata' demonstrators who used the effigy of a dog relieving itself on a bag of Tata tea. In the following caption of this YouTube video, it explains why the demonstrators created this effigy:

> *"Survivors of the 1984 Union Carbide Gas Disaster called on shopkeepers in Bhopal to stop selling TATA tea and TATA salt. The Bhopal rally charged Ratan Tata with causing damage to the people and environment of India by facilitating the expansion of American multinational Dow Chemical in this country. We will not take TATA salt. We will not take TATA tea."*

These types of campaigns are not only intended to raise awareness about the injustices that Bhopali survivors still face but they also advise the wider public of other related injustices and what actions to take to fight against them. As the direct actions on the ground in Bhopal, India, grew, other supporters worldwide are beginning to promote direct actions using social media.

7.5.2 Direct Actions through Distributed Networks

Social media are increasingly being used to mobilize direct actions worldwide but in distributed ways. Advocacy organizations use Facebook groups to encourage participation at educational events by informing its members about Bhopal disaster-related talks and documentary screenings in local communities. Other Facebook posts include requests to sign petitions that include a letter to the Prime Minister of India or to the CEO of Dow Chemical in support of the Bhopali survivors' demands for justice. Participatory forms of direct action also occur through action alerts sent to Facebook group members urging people to engage in activities that need immediate attention and action.

[114] http://www.youtube.com/watch?v=YEjqR0mkyUg&

For example, action alerts were sent out through the *Students for Bhopal* Facebook group urging its members to protest at the Dow Live Earth Run for Water events (a series of 6 km run/walks) that took place worldwide on April 18, 2010. They described it as a "greenwashing" PR stunt, where disinformation is disseminated by an organization so as to present an environmentally responsible public image. In this case, many supporters of Bhopal believed that Dow Chemical chose to be the main sponsor of this event in an effort to bury the past of not having taken responsibility for contaminating the water supply in Bhopal. Facebook group member Dede Minter shared the following post on the group wall:

> *"Join the facebook group The Truth about Live Earth: 'Greenwashing' Corporate Hypocrisy! Dow Chemical, the company liable for the ongoing contamination of soil and groundwater in Bhopal, is the main sponsor of Live Earth, a series of events with the mission of helping 'solve the water crisis'! This is a blatant PR stunt and attempt to hide Dow's abhorrent record of polluting ecosystems and poisoning people, usually the poor and marginalized. Fight back against this massive lie in solidarity with toxin-effected communities worldwide!"*

In addition to physically protesting at the Dow Live Earth Run for Water events, Facebook users had the option to join a dedicated Facebook group as a way of participating in a virtual protest.

Over the past four years, Students for Bhopal in collaboration with the International Campaign for Justice in Bhopal (ICJB) have been using social technology to mobilize an international social justice movement to connect communities worldwide actively involved in a variety of issues related to the Bhopal disaster (e.g., chemical safety, corporate accountability, environmental justice, globalization, and human rights issues). In December 2009, they created a *Map of 25th Anniversary Actions* (Figure 31), which allowed people to publicize locations of direct actions taking place in local communities through an interactive map interface. The Day of Actions that took place on the 20th, 24th, and 25th anniversaries of the Bhopal gas leak have been instrumental in bringing people together to learn about the Bhopal tragedy and to share stories

about the direct actions they have taken. One Students for Bhopal volunteer mentioned how someone had put a significant amount of work in editing the Bhopal disaster Wikipedia article in time for the 24th anniversary, which is evident in the number of edits in April and October 2008 just before the anniversary (Figure 32).

On one webpage[115] of the Students for Bhopal website (powered by Drupal), it allows visitors to share reports of the direct actions that took place in their local community. Some of the actions included a candlelit vigil in Berkeley, California; a public action event in Cambridge, Massachusetts, that began with a photo exhibit and ended with a petition to not work for Dow Chemical; passing *Resolution 09-21 Recognizing the Twenty-Fifth Anniversary of the Bhopal Disaster and Calling for a Report on Extremely Hazardous Substances Previously Released into the Local Environment* in Indiana at the Bloomington City Council; and a die-in protest that included hundreds of New York City students creating a "massive photogenic human installation" in Union Square, which read "CLEAN UP BHOPAL DOW" (Figure 33). Many of these direct actions are now being remembered through Flickr photos and YouTube videos.

[115] http://www.studentsforbhopal.org/bhopal25

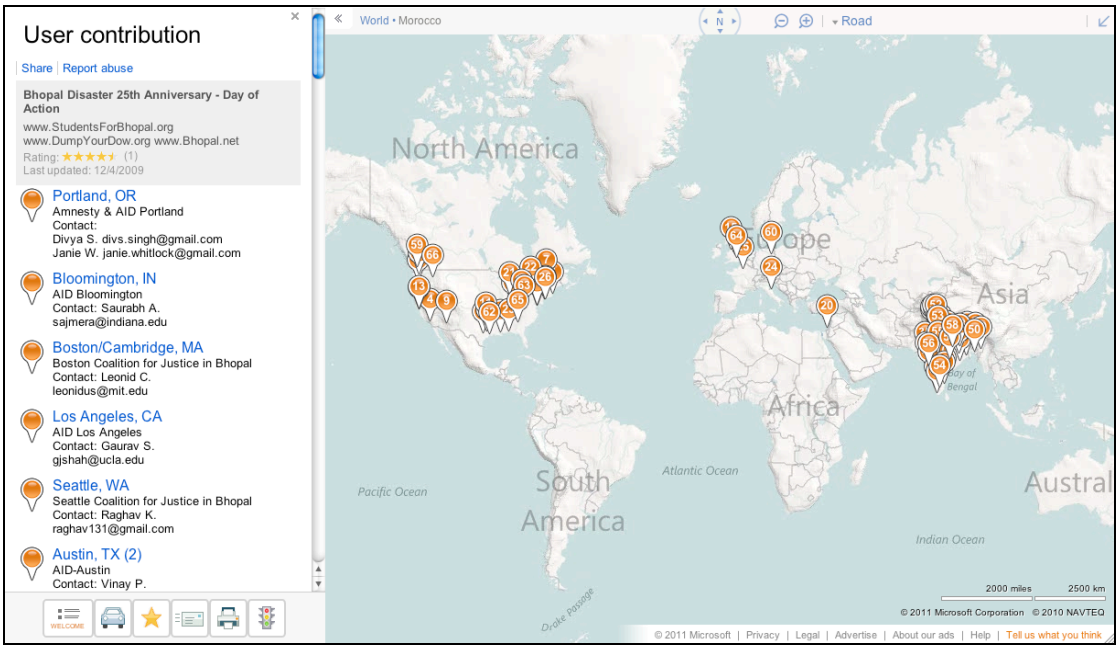

Figure 31: Map of 25th Anniversary Actions on Students for Bhopal Website

Month	# of edits	IPs	Minor	Graph — IPs — Minor — All edits
1/2008	23	13 (56.52%)	5 (21.74%)	
2/2008	28	19 (67.86%)	4 (14.29%)	
3/2008	33	14 (42.42%)	10 (30.30%)	
4/2008	100	26 (26.00%)	28 (28.00%)	
5/2008	36	18 (50.00%)	4 (11.11%)	
6/2008	21	6 (28.57%)	6 (28.57%)	
7/2008	24	6 (25.00%)	8 (33.33%)	
8/2008	38	23 (60.53%)	9 (23.68%)	
9/2008	15	9 (60.00%)	3 (20.00%)	
10/2008	259	33 (12.74%)	19 (7.34%)	
11/2008	45	35 (77.78%)	7 (15.56%)	
12/2008	72	14 (19.44%)	27 (37.50%)	

Figure 32: Number of Edits by Month for Bhopal Disaster Wikipedia Article in 2010 (source Soxred93)[116]

[116] http://toolserver.org/~soxred93/articleinfo/index.php?article=Bhopal_disaster&lang=en&wiki=wikipedia

Figure 33: Die-In Protest at Union Square in New York on the 25th Anniversary of the Bhopal Disaster Taken on December 3, 2009

Although these direct actions occurred in physical places, they were organized and publicized using social technology. The very interplay between these direct actions occurring in public places (often along busy streets) and then publicizing them via the web helped to raise awareness offline and online simultaneously. Additionally, Shana Bluestein Ortman from the International Campaign for Justice in Bhopal explained how the Bhopal-related direct actions have also facilitated stronger connections with communities concerned with broader environmental issues, especially those involved with the chemical safety movement. In an effort to bridge these communities, direct actions similar to the "We Will Not Take TATA Salt/Tea" campaign, mentioned previously, have also been promoted.

For example, an international coalition coordinated by ICJB began the *Dump Your Dow* campaign[117] in November 2009 to mark the 25th anniversary of the Bhopal disaster using the advert that appears in Figure 34. Since Dow Chemical took over Union Carbide in 2001, ICJB

[117] http://www.studentsforbhopal.org/?q=node/61

believes that Dow Chemical must abide by the "polluter pays principle" and address the fact that water in Bhopal still contains "alarmingly high levels of mercury, dichlorobenzene, chloroform, carbon tetrachloride and other persistent organic pollutants and heavy metals." ICJB also emphasizes how "Dow's dirty legacy reaches far beyond Bhopal. From producing Agent Orange used in the Vietnam War to dumping dioxins into the Saginaw River basin." The purpose of the campaign is to encourage people to "dump Dow from their portfolios, shelves, and organizations" and then "donate a portion of their earnings to the people of Bhopal who are still experiencing serious respiratory illnesses, birth defects and reproductive problems due to contaminated water 25 years later." ICJB suggested the following ways to *Dump Your Dow*:

> ***Dump Dow Stock*** *– All Dow stockowners are encouraged to sell before December 3 and donate a portion of the earnings to the Sambhavna Clinic, which specializes in treating gas-affected persons.*
>
> ***Dump Dow Products*** *– Stop using/buying things that have Dow products such as Clinique, Cover Girl, Coppertone, and L'Oreal.*
>
> ***Dump Dow Sponsorships*** *– All organizations, events, cities, and universities are encouraged to dump Dow's sponsorships until they clean up Bhopal and appear before the Bhopal District Court to face criminal charges pending against them.*

Figure 34: Dump Your Dow Campaign Ad

This type of call to action encourages people to take action in their daily lives and educate others about "Dow's dirty legacy." Thus, this online campaign facilitated a more distributed form of direct action where it would occur in people's homes and in local communities through everyday decisions. Networked technologies like the web and email, including viral social media channels like YouTube, have helped to broaden the awareness of this disaster as well as strengthen the formation of new relations that would have otherwise been difficult to form in the past at the same speed.

7.5.3 Direct Action through Deception

One particular incident that has shaped the digital heritage of the Bhopal disaster is the BBC hoax by The Yes Men. Unlike the previous examples of direct action that largely promoted statements of what is actually happening, this BBC hoax was a satirical form of direct action that used deception to also accurately explain the situation in Bhopal. The hoax began when The Yes Men—aka Andy Bichlbaum and Mike Bonanno—created a fake Dow Chemical website called *Dow Ethics*[118] claiming, "As a publicly owned corporation, Dow is unable, due to share-price concerns, to accept any responsibility for the Bhopal catastrophe caused by our fully owned subsidiary, Union Carbide." It was this website that led BBC World News to ask Dow Chemical, or rather the Yes Men, to appear on a special BBC live broadcast about the Bhopal disaster on the 20th anniversary in 2004. Andy Bichlbaum decided to impersonate a Dow Chemical spokesperson. On the BBC, he announced, "Dow Chemical accepts full responsibility for the Bhopal catastrophe" (Figure 35). He claimed that Dow has a $12 billion plan to liquidate Union Carbide, compensate the victims for medical care, remediate the Bhopal plant site, and fund research into the hazards of other Dow products. The hoax lasted about two hours as a top

[118] http://www.dowethics.com/

headline story in many newswires, which subsequently led to Dow's share price fall of 4.2 percent losing $2 billion in market value.

Figure 35: The Yes Men Hoax on the BBC with News Clip on YouTube (Uploaded by razorfoundation on January 2, 2007)

This hoax is an example of what some refer to as "culture jamming," where the intention is to enforce a response or a reaction of some kind by disrupting or subverting the mainstream culture. The tactic here was to "disrupt the media space that corporations like Dow Chemical are used to controlling" and then "communicate what is wrong with them to a mass audience" (Mike Bonanno, personal communication). The main intention of The Yes Men's Bhopal hoax was to raise awareness of the Bhopalis' plight and to provide an "honest representation of what Dow Chemical should do," according to Bichlbaum. In *The Yes Men* Wikipedia article, it states:

> *"One of the effects of apologizing and promising support on behalf of an organization is that the organization is then later forced to re-acknowledge the event in question and retract all of the proposed good will. This served to further publicize the negative event of the organization and sets-up the organization to look bad for taking back any support The Yes Men offered under the name of their organization."*

Although the Yes Men provided false hopes to Bhopalis for two hours, The Yes Men justify their actions by explaining that it was worth the attention it received to spread awareness about the "20 years of unrealized hope" that occurred in the aftermath of the Bhopal gas leak. Amidst the deception of the hoax, the other statements made during the interview by Bichlbaum also included factual statistics about the past and current situation in Bhopal.

Since this interview was broadcasted live on the BBC and then virally shared through the newswires during the two hours before people realized it was a hoax, the Bhopal story immediately became more visible in American mainstream news outlets, which did not occur during the previous anniversaries of the Bhopal disaster. This news clip has become the most viewed Bhopal disaster-related YouTube video, receiving over 175,000 views for razorfoundation's *Bhopal Disaster – BBC – The Yes Men*[119] video upload and 436,364 views for another YouTube user's upload of the same news clip. In an interview with razorfoundation, he explains his motivation for sharing this video:

> *"A friend of mine raised my awareness to the Yes Men hoax, I didn't know them. I wasn't even aware of the Bhopal disaster then! I obtained the video through a P2P network such as eMule searching for 'bhopal.' I decided to upload the video since I thought it was a hoax very much worth doing and was very well executed. Furthermore, Dow's (expected) denial after the video immensely re-exposed the corporation's failure to properly address the Bhopal situation, in my opinion."*

In addition to the large number of views, this video also generated 255 comments from a wide variety of users engaging in discussions with other YouTube users that they had not engaged with before. Multiple types of conversations developed discussing the hoax, facts about the Bhopal disaster, and other examples of corporate responsibility issues. Some raised concerns that The Yes Men did not consider Bhopalis' emotions during and after the hoax, yet one of the comments to this video in response to this issue explains:

[119] http://www.youtube.com/watch?v=LiWlvBro9eI

> *"The Yes Men have stated that they have received email and other communication from many people in Bhopal stating that after their initial shock at finding out it was a hoax, they are very happy with the attention that the stunt has brought to the Bhopal disaster and also all of the additional help they have been given through volunteer programs and financial aid."*

Although deception and disinformation are typically seen as negative actions, in the case of The Yes Men hoax on the BBC, it led to an increase in awareness of the Bhopal disaster, which subsequently led to an increase in support that Bhopalis may not have received otherwise. This incident is unusual and uncommon, but it sheds light on alternative ways to promote direct actions through sociopolitical satire and subsequently raise awareness of a crisis that still continues to affect thousands to this day.

7.6 The Living Heritage of the Bhopal Gas Leak in Social Media

In this chapter, I presented five meta-narratives pertaining to the 1984 Bhopal gas leak that appear in the social media landscape. Section 7.1 presented narratives that explain the myriad of causes that led to the gas leak. Section 7.2 presented narratives from survivors and about the survivors of the Bhopal disaster. Section 7.3 presented narratives regarding the ongoing effects of the gas leak and the unfinished aspect of the Bhopal disaster. Section 7.4 presented narratives that reference scientific and vetted reports. Section 7.5 presented narratives about the direct actions that emerged in response to the Bhopal tragedy. At the end of the Chapter 8 regarding the second crisis case, I return to the discussion of these five meta-narratives by comparing the 1984 Bhopal gas leak meta-narratives to the 2001 September 11 attacks meta-narratives.

As a final thought, it is worth reflecting on the following excerpt taken from Sufrin's (1985) book titled *Bhopal: Its Setting, Responsibility and Challenge* written just a year after the gas leak:

> *"The Bhopal accident soon will become a social memory with a line or two in history books and a page in law books. Soon the afflicted people will become a sad fixture in a small geographical segment of India, largely forgotten. The more than 100 score of dead will become memories, every growing dimmer in the thoughts of their families. But Bhopal as a lesson and as an example of the indifference and thoughtlessness of modern industry will not, and indeed cannot and should not, become a mere historical incident. Bhopal and what happened at the Union Carbide plant shortly after midnight on December 3, 1984, is a dramatic signal that responsibility is a real and pervasive necessity and not only the subject of academic and empty discussion" (p. 23).*

Sufrin's prediction and interpretation of the social memory regarding the Bhopal disaster is a curious one. Although the Bhopal gas leak continues to be the worst industrial accident in history, many people today still do not know the story of Bhopal. However, the memory practices that are beginning to emerge in the social media landscape pertaining to the Bhopal disaster is a promising one that is preventing it from just being a line or two in a book. The memory of Bhopal gas leak is staying alive through the creation of a full length *Bhopal disaster* Wikipedia article; the sharing of Flickr photos and YouTube videos; on the writing of blog posts and Facebook wall posts, which has not only documented the 1984 gas leak tragedy but also the ongoing contamination in Bhopal. The Bhopal legacy will still continue until the lessons of Bhopal are learned today.

CHAPTER 8
THE 2001 SEPTEMBER 11TH ATTACKS CASE

According to the official account, on September 11, 2001, a series of coordinated suicide attacks upon the United States (US) occurred in three locations. Allegedly, 19 al-Qaeda terrorists highjacked four commercial passenger jet airliners. American Airlines Flight 11 crashed into the North Tower of the World Trade Center (WTC) in New York City at 8:46 a.m. Eastern Daylight Time (EDT). United Airlines Flight 175 crashed into the South Tower of the WTC at 9:02 a.m. EDT. American Airlines Flight 77 crashed into the Pentagon in Arlington, Virginia, at 9:37 a.m. EDT. The South Tower of the WTC collapsed at 9:58 a.m. United Airlines Flight 93 crashed into a field near Shanksville, Pennsylvania, at 10:03 a.m. The North Tower of the WTC collapsed at 10:28 a.m. EDT. Last, Building 7 of the WTC collapsed at 5:20 p.m. EDT . These attacks led to approximately 3,000 deaths. These concerted attacks were the deadliest terrorist attacks in the US and led to what some have called "the War on Terrorism."

In this chapter, I present five types of meta-narratives that emerged from my interpretive analysis of social media to illuminate the complex story of the 2001 September 11th attacks (aka 9/11) that has unfolded in the social media landscape.

- Section 8.1 presents narratives that explain causes of the 9/11 attacks.
- Section 8.2 presents narratives from survivors and witnesses of the attacks.
- Section 8.3 presents narratives about the ongoing crises related to 9/11.
- Section 8.4 presents narratives from scientific investigations about 9/11.
- Section 8.5 presents narratives about direct actions taken in response to 9/11.

Table 22 delineates the social media artifacts that encompass the 2001 September 11 attacks social media web sphere. In this chapter, I reference some of these artifacts.

Social Media Artifacts in September 11 Attacks Web Sphere			
Wikipedia: September 11 attacks	15,181 Edits 4.5 Edits/Day 4,820 Editors 1,315 Watchers 272 References	**9/11 List-Serv Google Group**	5,402 Members 2,267 Messages First message on January 4, 2007
Facebook	322 Groups 216 Pages 316 Causes	**Twitter**	119,264 Tweets 78,380 Twitter Users 27,617 URLs
Flickr	262,600 Images 173 Group	**YouTube**	2,110,000 Videos 58,200 Playlists
Delicious	970 Bookmarks	**Digg**	2,007 Digg Results
Blogosphere	16,257,570 Blog Posts	**Mashups**	21 Results
September 11 Digital Archive	150,000 Digital Items	**Archive-It**	4,129,166 Results
Here Is New York	5,690 Photos	**History Commons**	6,412 Events

Table 22: Social Media Artifacts in September 11 Attacks Web Sphere

8.1 The Cause of the September 11th Attacks

This section presents narratives related to the cause of the attacks that emerged after coding the social media artifacts. The September 11 attacks were a social, human-induced hazard that many refer to as a terrorist attack. I first discuss the "Act of Terror" narrative and the reactions to this official narrative. Then, I present pre-9/11 events that appear in comprehensive timelines that depict the long history of 9/11. Last, I describe juxtapositions of "9/11 facts" that illuminate what some believe are the causes of the 9/11 crisis.

8.1.1 Act of Terror: The Official Narrative

The official narrative of what caused the September 11 attacks stems largely from the accounts by the US government and mainstream news media. On the evening of September 11,

2001, former President George W. Bush gave a speech[120] to the American people that began with the following statement:

> *"Today, our fellow citizens, our way of life, our very freedom came under attack in a series of deliberate and deadly terrorist acts. The victims were in airplanes or in their offices: secretaries, business men and women, military and federal workers, moms and dads, friends and neighbors. Thousands of lives were suddenly ended by evil, despicable acts of terror."*

It was on the same day of the attacks that President Bush deemed the September 11th attacks as an "act of terror." Many mainstream news outlets also conveyed the same message using headlines like "Day of Terror," "Terror Hits Home," "Evil Acts of Terror," and just the word "Terror." With these slogans circulating the mainstream media and used by the Bush administration, this crisis was declared a "terrorist attack." The Federal Emergency Management Agency (FEMA) at the US Department of Homeland Security defines *terrorism*[121] as "the use of force or violence against persons or property in violation of the criminal laws of the United States for purposes of intimidation, coercion, or ransom."

Figure 36 contains photos taken at the Newseum's *9/11 Gallery: Chronicling an Attack on America*. Here I show four newspapers printed on September 12, 2001, the day after the attacks. The front-page headlines of these and many other newspapers were uploaded to Flickr by cliff1066[122] on August 12, 2010. These images illustrate how people predominantly received the official "act of terror" narrative, namely, through mainstream media, such as newspapers and television news broadcasts.

[120] http://www.americanrhetoric.com/speeches/gwbush911addresstothenation.htm
[121] http://www.fema.gov/hazard/terrorism/info.shtm
[122] http://www.flickr.com/photos/nostri-imago/sets/72157623290604752/

Figure 36: September 12, 2001 Headlines of Four Newspapers (Uploaded to Flickr by cliff1066 on August 12, 2010)

The belief that terrorism caused this crisis permeated the artifacts people created to commemorate this national tragedy. For example, *Here Is New York*[123] was an idea that started a week after the 9/11 attacks. This idea led to a spontaneous exhibition—"an impromptu memorial" of photos that opened on September 25, 2001. The photos were first displayed at a storefront at 116 Prince Street in SoHo, New York. It evolved into a unique exhibition selling photographs to benefit the children of the victims who were affected by the 9/11 attacks. Subtitled "A Democracy of Photographs," *Here Is New York* was a gallery that sought to display anonymous contributions from "anyone and everyone" who had taken photos related to the events of 9/11. These contributors included professional photographers, firefighters, construction workers, schoolteachers, children, and others who wanted to share a photo related to 9/11. In the introduction to the *Here Is New York* archive, Michael Shulan makes the following remark:

> *"Terrorism was all too familiar in other parts of the world, but it had rarely happened in the United States, and never on such a scale. Besides announcing that this is the face of our city's tragedy, the title here is new york declares that we understand the problem of terrorism to be a global one that respects no geographic or cultural boundaries. After 9.11, New York is Everywhere."*

Shulan's remark sets the stage for exhibiting the unprecedented documentation of how members of the public reflected on this "act of terror" that took place on the American homeland.

The next five photos depict the wide range of reactions to the terror narrative on the streets of New York. Figure 37 is a photo of graffiti using the dust that blanketed Manhattan, New York. It reads, "Nuke Them All." Although it is difficult to know who "them" refers to, this statement suggests an act of violence in response to the attacks. Similarly, Figure 38 is a photo of graffiti from stencil spray paint that reads: "Wanted Dead Not Alive Bin Laden" with an image of Osama bin Laden. Many different versions of this statement appeared throughout New York,

[123] http://hereisnewyork.org

revealing the increase of incitement and revenge against the presumed perpetrator of the attacks (i.e., Osama bin Laden).

Figure 37: Nuke Them All – Photo in *Here Is New York* Archive
(Source: http://hereisnewyork.org/gallery/showbig.asp?photoID=87)

Figure 38: Wanted Dead Not Alive Bin Laden – Photo in *Here Is New York* Archive
(Source: http://hereisnewyork.org/gallery/showbig.asp?photoID=1538)

Figure 39 is a computer-generated image that suggests how a plane crashing into the World Trade Center has come to symbolize one of the "acts of terrorism." The creator of this image uses the familiar symbol of the slashed out red circle as an attempt to reflect the potentially pervasive act of terrorism in society. The iconic representations of the World Trade

Center Twin Towers also commonly appeared in memorials around Manhattan. These towers symbolize America's economic power. Since the WTC in New York was the financial heart of the US, as some would say, the WTC attacks symbolized an attack on America's economic power.

Figure 39: Do Not Perform Acts of Terrorism – Photo in *Here Is New York* Archive (Source: http://hereisnewyork.org/gallery/showbig.asp?photoID=698)

Figure 40 depicts one of the many protests that occurred in response to the "fighting terrorism" narrative. This photo shows a person holding a sign that says, "Shooting at Innocent Palestinian Civilians Is Not 'Fighting Terrorism' It IS Terrorism." Another sign shows Israeli and Palestinian casualty counts as a result of the occupation between September 2000 and April 2002. Images of these protests reflect the urge for nonviolence in response to the terrorist attacks.

Figure 40: Protestors Photo in *Here Is New York* Archive (Source: http://hereisnewyork.org/gallery/showbig.asp?photoID=7549)

Last, Figure 41 is a photo of graffiti on large white paper with the following questions written: "how do you spell state sponsored terrorism?...made in the USA?" This reflects a controversial reaction to the attacks that some might view as part of the backlash to the idea of "terrorism" that became pervasive in the aftermath of the attacks.

Figure 41: How Do You Spell State Sponsored Terrorism? Photo in *Here Is New York* Archive (Source: http://hereisnewyork.org/gallery/showbig.asp?photoID=7388)

As the "Act of Terror" narrative continued, military action became inevitable with the Bush administration's "War on Terrorism" narrative (which is further discussed in Section 8.3.1). According to the *Timeline of the War on Terror*[124] Wikipedia article, this campaign began with the 2001 September 11 attacks followed by the anthrax attacks later in 2001. In response to the attacks on the US, two wars followed: the War in Afghanistan (beginning on October 7, 2001) and the War in Iraq (beginning on March 20, 2003). Some of my participants emphasized that war was not the appropriate reaction to the 9/11 attacks, since this decision was made under the influence of anger and hatred. In an interview with Akiva Steinmetz-Silber, who attended

[124] http://en.wikipedia.org/wiki/Timeline_of_the_War_on_Terror

Stuyvesant High School near the WTC at the time of the attacks, he explains how "the media tended to only show the twin towers being attacked but not the effects of the attack on the city and how people came together. It was these images that lent itself to making people want to go to war." Tery Spataro, who also lived in New York at the time of the attacks, mentioned how a "more reactive response occurred and the attacks were not immediately dealt with emotionally." The priority after the attacks was war and many believed that the 9/11 attacks were used to justify the several wars on terrorism that followed. As the "act of terror" unfolded with the result of post-9/11 wars, some began to investigate the pre-9/11 events to understand the underlying root causes of the 9/11 attacks.

8.1.2 Pre-9/11 Events

Of the four attacks that occurred on September 11, 2001, the attacks on the World Trade Center towers were the most shocking and led many to believe that an attack using highjacked planes was inconceivable. Yet, the documentation of the pre-9/11 events that pervade the social media landscape challenges this belief. This subsection presents two examples of how pre-9/11 events were documented and shared to educate the public about the complex history of the 9/11 attacks.

The first example appears in the *September 11 Digital Archive*.[125] This archive was funded by a major grant from the Alfred P. Sloan Foundation and organized by the American Social History Project at the City University of New York Graduate Center and the Center for History and New Media at George Mason University. The archive contains firsthand accounts of the 9/11 attacks and the aftermath including emails and digital images, organizes and annotates 9/11 web-based resources, and provides additional materials to contextualize and teach about the

[125] http://911digitalarchive.org

events. This archive is also a test as to how history is being recorded and preserved in the 21st century through software and other digital technology. Their main goal is to foster positive legacies of the terrible events of 9/11 by allowing people to tell their stories, making those stories available to a wide audience, providing historical context for understanding those events and their consequences, and helping historians and archivists improve their practices based on the lessons learned from this project.

In the *September 11 Digital Archive* under the *9/11 Links* tab, it lists a website entitled *The Road Through 9/11: A Chronology,*[126] which is a site created on April 3, 2003, containing three sets of timelines related to 9/11. Charles Nicholas Parmely, the creator of this site, explains:

> *"The 9/11 attacks changed the world, suddenly ushering in an era of instability and insecurity that seems likely to persist for years. There's a great deal of misinformation about the attacks, their background, and their consequences. I've attempted to help sort out the confusion by putting together a set of detailed chronologies covering the events that led to and led from 9/11, as well as a timeline of the day of September 11.*
>
> *These timelines are an attempt to trace the developments that led to 9/11, to describe the events of the day of September 11, and to follow the troubled times after the attacks. Before September 11, the main focus is on the Middle East and on the rise of terrorism and counter-terrorism, but some American political, diplomatic, and economic developments are included as well."*

His personal motivation for creating and sharing this exhaustive chronology about 9/11 was because of the "misinformation" not only about the attack but what led up to the attacks. Although this site is not social media per se, it instead is an example of content from the *September 11 Digital Archive*, which is an early version of an open digital archive that contains Web 2.0 features.

In this chronology, Parmely organizes the chronology on the "Background to 9/11" into the following eight time periods: (1) 1948-1978: The Birth of the Modern Middle East, (2) 1979-

[126] http://cnparm.home.texas.net/911/Intro.htm

1986: The Rise of Islamist Extremism, (3) 1987-1992: New World Order, (4) 1993-1995: Lost Chance - The Oslo Era, (5) 1996-1998: Bin Laden Proclaims Jihad, (6) 1999-2000: Terrorism and Counter-Terrorism, (7) January-June, 2001: Swing to the Right, and (8) July-September 10, 2001: Countdown. Source abbreviations are included if they are known; all of the sources are from websites. Parmely also marked each event with a text symbol to categorize them in the following ways: The Levant: Israel, Palestine, Jordan, Lebanon, Syria, and Turkey; Egypt and North Africa; The Persian Gulf Region and Arabia; Central and Southern Asia; Africa; Europe and the Soviet Union; the United States; Non-Islamist Terrorism; Islamist Extremists; Islamist Terrorism (not al-Qaeda); al-Qaeda and bin Laden; the 9/11 Operation; and Counterterrorism.

Parmely highlights the text in bold to draw attention to certain events that played a central role in the 9/11 attacks. The first event that appears in the chronology is May 14, 1948, when the state of Israel is proclaimed. The following statement appears in this event and suggests the reason for relating this event to 9/11: "**The Israeli-Palestinian conflict becomes the most intractable source of instability in the Middle East** (source: Mark Tessler)." The following is a selection of other events that were in bold to provide a sense of the 9/11 history based on Parmely's 9/11 chronology:

- ***1953*** *August: In Iran, reformist Prime Minister Mossadegh is overthrown by the Shah with backing from the CIA. American influence remains strong in Iran until 1979.* ***The United States is becoming a major player in the Middle East****.*
- ***1962*** *August 19:* ***The United States begins to align with Israel*** *- warily under Kennedy, more openly under Johnson, enthusiastically under Nixon & Kissinger.*
- ***1968*** *July 23:* ***The first airplane hijacking by Middle Eastern radicals****: A newly formed Marxist-Leninist group, the Popular Front for the Liberation of Palestine (PFLP), begins a hijacking campaign by seizing an El Al flight, forcing it to fly to Algiers, and holding Israeli passengers and crew hostage for over a month. This episode marks* ***the beginning of the first wave of international terrorism, which lasts through the early 1970s****.*

- ***1970** September 6-12: **The first large-scale terrorist operation**: the Palestinian PFLP hijacks three airliners on Sep.06, fails in a fourth attempt on the same day, and then hijacks a fifth plane on Sep.09.*
- ***1993** February 26: **The first major Islamist terrorist attack within the US: the original World Trade Center bombing** is carried out by Ramzi Yousef and associates from the Alkhifa Center in Brooklyn.*
- ***1998** August 7: On the eighth anniversary of the arrival of US troops in Saudi Arabia, **al-Qaeda truck-bombs the US embassies in Kenya and Tanzania**.*
- ***2001** May-July: **Intelligence reports of impending attacks from al-Qaeda reach a crescendo from May to July**. In these months, the NSA intercepts at least 33 communications that indicate a major terrorist attack is imminent. None indicate where or when the attack will occur. Some of the intercepts hint that the attack will be the most devastating al-Qaeda has yet attempted. [Senate Intelligence Committee Hearings Sep.18.2002 / New York Times May.17.2002]*

Parmely's 9/11 chronology presents a complex series of events of what he believes led up to the 9/11 attacks. This chronology is one of the 19 chronologies he has created on his website. Although he emphasizes that he is not a historian, a journalist, or an authority on any of the main topics mentioned in the chronology, he does show expertise in creating chronologies and collecting news articles, comments, and other relevant postings.

The *Complete 9/11 Timeline*[127] is another resource that provides a comprehensive history of the 9/11 attacks. It is one of the 31 project timelines that appear in the History Commons[128] website, which is a dynamic timeline tool for "open-content participatory journalism." Although this site does not specifically classify itself as a type of social media, the basic features within the site contain Web 2.0 principles by allowing any registered user to create and edit content. The purpose and significance of History Commons, according to their website, is as follows:

> *"To provide a means for members of civil society to monitor the activities of powerful entities, such as governments, large corporations, and wealthy and influential individuals. In this capacity, the website should be regarded as an IT toolset that enables members of the public to operate as a sort of people's intelligence agency.*

[127] http://www.historycommons.org/project.jsp?project=911_project
[128] http://www.historycommons.org/

> *To further blur the line between readers and journalists. This website, like blogs and other applications that allow self-publishing, allows Big Media's former audience to assume the roles of content creators, editors, and publishers.*
>
> *To increase the efficiency of information production. This project is premised on the notion that collaboration in a networked "open-content" environment can greatly improve the efficiency and quality of information production in the public sphere as it allows contributors to build upon and improve the work of others in real time as part of a global community.*
>
> *To increase the efficiency of information acquisition. Another objective of the Center for Grassroots Oversight is to increase the efficiency of research by reducing the tendency for researchers to duplicate the efforts of others.*
>
> *To reduce the fragmentation of the historical record. This project seeks to help reduce the fragmentation of the historical record by connecting events whose temporal and spatial relationships are often obscured by a mass of contradicting and disconnected literature, the biases of the media, and the tendency for important past events to be relegated to the annals of forgotten history…this project hopes to reduce the amount of time it takes for the public to acquire a full and coherent picture of an event or issue."*

Derek Mitchell, the creator of History Commons, explains in an interview, "People don't know history; they have a superficial understanding of history…If you don't know history you don't know who you are; we are the product of history." He further points out that this site allows the wider public to "reclaim control of our story, our narrative, by transferring the responsibility of writing history and reporting current events from institutions and corporate media to anyone that has the interest to write history on their own."

The *Complete 911 Timeline* is an attempt to tear apart the 9/11 official story and reclaim the 9/11 narrative by listing all relevant information from vetted sources in chronological order. Paul Thompson,[129] the original creator of this timeline, explains:

> *"…we unabashedly focus on failures, problems, and controversies instead of success stories. That's because those are the things we need to learn from and fix and hold people responsible for when necessary…No matter what you may believe about what happened on 9/11, even after five years it is obvious to anyone who looks at this timeline that there are still too many questions, contradictions in the official story, and efforts by the government to obfuscate the record."*

[129] http://www.historycommons.org/project.jsp?project=911_project

Not all the events that appear in the timeline are "true" since many of them are contradictory, but what this timeline shows is the ongoing and complex narrative of 9/11 that is still unfolding.

The *Complete 911 Timeline* contains 6,412 events with the first event beginning in 1968 and the most recent event on March 6, 2010. These events are categorized in a number of ways with 759 "Before 9/11" events; 1,047 "Day of 9/11" events; and 209 "Post-9/11 World" events, to name a few of the categories. Many of the events that appear in this timeline are largely from contributions by environmental activist Paul Thompson, who later used the material he contributed to this site for his book entitled *The Terror Timeline*. In this subsection, I focus on the pre-9/11 events that appear in the timeline.

The "Before 9/11" category contains multiple subcategories. There are 104 events related to the "Soviet-Afghan War," 219 events related to "warning signs," 49 events related to "insider trading/foreknowledge," 65 events related to "US Air Security," 54 events related to "military exercises," 67 events related to "pipeline politics," and 46 "other pre-9/11 events." This array of categories represent a complex set of issues related to what may have caused the 9/11 attacks. The timeline also contains a category with 95 events labeled as "Key Warnings." The following are snippets of some of these key warning events:

- ***December 24, 1994**: **Al-Qaeda Connected Militants Attempt to Crash Passenger Jet into Eiffel Tower** – Even though this is the third attempt in 1994 to crash an airplane into a building, the New York Times will note after 9/11 that "aviation security officials never extrapolated any sort of pattern from those incidents." [NEW YORK TIMES[130] 10/3/2001]*
- ***February 1995-1996**: **Bojinka Plotter Says 10 Suicide Bombers Training in US; Not Much Follow Up Investigation** – While Bojinka plotter Abdul Hakim Murad is being interrogated by Philippine Colonel Rodolfo Mendoza (see February-Early May 1995), he mentions that he had pilot training in the US and ten other operatives are being trained to fly in the US. Mendoza will later recall that Murad said, "There is really formal training [going on] of suicide bombers. He said that there were other Middle Eastern pilots training and he discussed with me the names and flight*

[130] http://www.nytimes.com/2001/10/03/national/03WARN.html

training schools they went to." Murad also mentioned some of their targets had already been picked and included CIA headquarters, the Pentagon, and an unidentified nuclear facility. [LANCE[131] 2003, PP. 279]

- ***Early 1998**: **CIA Ignores Ex-Agent's Warning Khalid Shaikh Mohammed (KSM) Is 'Going to Hijack Some Planes,' Visiting Germany** – Former CIA agent Robert Baer working as a terrorism consultant meets Hamad bin Jassim bin Hamad al Thani…He tells Baer that KSM "is going to hijack some planes."…In early 1998 Baer sends this information to a friend in the CIA Counterterrorist Center, who forwards the information to his superiors. Baer doesn't hear back from the CIA. He says, "There was no interest." [BAER[132] 2002, PP. 270-71; VANITY FAIR, 2/2002; UNITED PRESS INTERNATIONAL, 9/30/2002; BAER[133] 2003, PP. 190-198]*
- ***December 4, 1998**: **Clinton Warned 'Bin Laden Preparing to Hijack US Aircraft' Inside US** – On December 4, 1998, an item in President Clinton's Presidential Daily Briefing (PDB) is titled, "Bin Laden Preparing to Hijack US Aircraft and Other Attacks."…The same source says bin Laden may implement plans to hijack US aircraft before the start of the Muslim holy month of Ramadan on December 20 and that two members of the operational team had evaded security checks in a recent trial run at a New York airport…The PDB also says that "some members of the bin Laden network have received hijack training, according to various sources, but no group directly tied to bin Laden's al-Qaeda organization has ever carried out an aircraft hijacking. Bin Laden could be weighing other types of operations against US aircraft." [WASHINGTON POST[134] 7/18/2004; 9/11 COMMISSION[135] 7/24/2004, PP. 128-130]*
- ***September 1999**: **US Report Predicts Spectacular Attack on Washington; Al-Qaeda Could 'Crash-Land Aircraft' into Buildings** – A report prepared for US intelligence titled the "Sociology and Psychology of Terrorism: Who Becomes a Terrorist and Why" is completed. It states: "Al-Qaeda's expected retaliation for the US cruise missile attack… could take several forms of terrorist attack in the nation's capital…Whatever form an attack may take, bin Laden will most likely retaliate in a spectacular way." [ASSOCIATED PRESS, 4/18/2002] The report discusses the 1993 World Trade Center bombing and includes a picture of the WTC towers. [HUDSON[136], 1999, PP. 4; LOS ANGELES TIMES, 5/17/2002] The Bush administration will later claim to have never heard of this report until May 2002, despite the fact that it had been publicly posted on the Internet since 1999, and "widely shared within the government," according to the New York Times. [CNN[137] 5/18/2002; NEW YORK TIMES[138] 5/18/2002]*
- ***April 2000**: **Would-Be Hijacker Tells FBI About Plot to Fly Plane into US Building** – Niaz Khan, a British citizen originally from Pakistan, is recruited into an al-Qaeda plot. In early 2000 he is flown to Lahore, Pakistan, and then trains in a*

[131] http://www.amazon.com/exec/obidos/ASIN/006054354X/centerforcoop-20
[132] http://www.amazon.com/exec/obidos/ASIN/140004684X/centerforcoop-20
[133] http://www.amazon.com/exec/obidos/ASIN/1400052688/centerforcoop-20
[134] http://www.washingtonpost.com/wp-dyn/articles/A58615-2004Jul17.html
[135] http://web.archive.org/web/20041020144854/http://www.decloah.com/mirrors/9-11/911_Report.txt
[136] http://www.loc.gov/rr/frd/pdf-files/Soc_Psych_of_Terrorism.pdf
[137] http://archives.cnn.com/2002/US/05/17/bush.sept.11/index.html
[138] http://www.nytimes.com/2002/05/18/politics/18FLIG.html

compound there for a week with others on how to hijack passenger airplanes…In April 2000 he flies to the US and told to meet with a contact. He says, "They said I would live there for a while and meet some other people and we would hijack a plane from JFK and fly it into a building." [LONDON TIMES, 5/9/2004] He has "no doubt" this is the 9/11 plot. However, Khan slips away and gambles away the money given to him by al-Qaeda. Afraid he would be killed for betraying al-Qaeda, he turns himself in to the FBI. For three weeks, FBI counterterrorism agents in Newark, New Jersey interview him. [MSNBC[139] 6/3/2004; OBSERVER[140] 6/6/2004] One FBI agent recalls, "We were incredulous. Flying a plane into a building sounded crazy but we polygraphed him and he passed." [LONDON TIMES, 5/9/2004]

- ***July 10, 2001**: **CIA Director Gives Urgent Warning to White House of Imminent, Multiple, Simultaneous Al-Qaeda Attacks, Possibly within US** – CIA Director George Tenet finds the briefing that counterterrorism chief Cofer Black gave him earlier in the day so alarming that he calls National Security Adviser Condoleezza Rice from his car as he heads to the White House and says he needs to see her right away. [WASHINGTON POST[141], 10/1/2006]… There are conflicting accounts about the CIA's reading of Rice's response. According to Woodward: "Tenet and Black [feel] they [are] not getting through to Rice. She [is] polite, but they [feel] the brush-off." They leave the meeting frustrated, seeing little prospect for immediate action. Tenet and Black will both later recall the meeting as the starkest warning they gave the White House on al-Qaeda before 9/11 and one that could have potentially stopped the 9/11 attacks if Rice had acted on it and conveyed their urgency to President Bush. [WOODWARD[142] 2006, PP. 80; WASHINGTON POST[143] 10/1/2006]*

These are just seven of the 95 events that were seen as warning signs of the 9/11 attacks. The overwhelming amount of material in the *Complete 9/11 Timeline* paints a convoluted narrative that is distributed across mainstream news reports, books, official reports, and other publicly available documents.

Similar to *The Road Through 9/11: A Chronology*, the *Complete 9/11 Timeline* presents the broader context to more accurately depict the 9/11 narrative. Kevin Fenton, one of the project managers for History Commons, explains:

[139] http://www.msnbc.msn.com/id/5131524/
[140] http://www.guardian.co.uk/world/2004/jun/06/september11.terrorism
[141] http://www.washingtonpost.com/wp-dyn/content/article/2006/09/30/AR2006093000282_pf.html
[142] http://www.amazon.com/exec/obidos/ASIN/0743272234/centerforcoop-20
[143] http://www.washingtonpost.com/wp-dyn/content/article/2006/09/30/AR2006093000282_pf.html

> *"I originally did the 9/11 timeline because I figured the initial account of the attacks and the run-up to them was not 100% accurate. I also figured that the truth was out there and a whole bunch of stuff could be pieced together from media accounts and government documents, which turned out to be much truer than I thought at the time (we've found a load of stuff buried here and there, where its significance was not previously appreciated and it needed to be put in its context to get the best out of it)."*

Mike Tuck, another project manager at History Commons, further points out, "If we draw from enough sources, we can start to paint a complete picture…People can't change things if they don't know what happened. We are not addressing the root causes, we are just putting up security screens, it's still not going to stop terrorism, but we still need to look at the root causes." These comprehensive timelines have become instrumental in presenting the complex history of the 9/11 attacks to shed light on its underlying causes.

Moreover, what makes the pre-9/11 events depicted in *The Road Through 9/11: A Chronology* and the *Complete 9/11 Timeline* quite compelling is when facts from these timelines and other official sources are juxtaposed with comments by government officials responding to criticism and denying that they had advance warning of the attacks on the US. In the next subsection, I present examples of these juxtapositions that more quickly imply the impetus behind the 9/11 attacks.

8.1.3 Juxtapositions of "9/11 Facts"

The causes of the 9/11 attacks become clearer when official narratives are juxtaposed with "facts" or "evidence" that contradicts narratives put forth by government officials. Here I present four examples of juxtapositions that question the official narratives.

In a special broadcast on *Bill Moyers Journal* titled "9/11 for the Record," Moyers—an American journalist and public commentator—questions whether government officials had advance warnings of the attacks. It presents extracts from testimonies and interviews as well as

analytical findings from the 9/11 Commission. A YouTube user named Iitxlit uploaded this episode to YouTube. The following is a snippet of the transcript from this episode:

> *MOYERS: In the days and weeks after 9/11, a shocked and grieving people began to ask what government officials had known and when they had known it. Eight months later, the President's National Security Adviser tries to quiet the criticism.*
>
> *RICE: I don't think anybody could have predicted that these people would take an airplane and slam it into the World Trade Center, take another one and slam it into the Pentagon; that they would try to use an airplane as a missile, a hijacked airplane as a missile.*
>
> *MOYERS: But Condoleezza Rice is wrong. Had she looked, Dr. Rice might have found in the files of the intelligence community what the 9/11 Commission would uncover. The attack she deemed unimaginable had, in fact, been imagined. Repeatedly. Twelve times in the seven years before 9/11, the CIA reported that hijackers might use airplanes as weapons. The most specific of those warnings involve this man: Khalid Sheikh Mohammed…KSM not only imagined the unimaginable, he engineered it.*

During this transcript, a video of Condoleezza Rice is shown making the above statement during a press briefing on May 16, 2002. Moyer argues against the veracity of Rice's statement by explaining the repeated attempts and warnings of airplane attacks, which are found in both *The Road Through 9/11: A Chronology* and the *Complete 9/11 Timeline*.

Another example of how 9/11 facts are juxtaposed appears in a YouTube video entitled *What motivated the 9-11 hijackers See testimony most did not*.[144] The Representative Press campaign created this video but DanKGlassworksdotcom uploaded it to YouTube on August 28, 2010. It begins with the following caption: "What motivated the 9/11 hijackers to attack the US? US foreign policy bias for Israel in the Israeli-Palestinian conflict and US support for other oppressive regimes in the Middle East." It then presents a series of video clips, captions, and highlighted text to legitimate the answer given in the previous question. In the first clip Lee

[144] http://www.youtube.com/watch?v=AFA3kLi8sck

Hamilton, Vice Chair of the 9/11 Commission asked the following question during the final public hearing held on June 16-17, 2004:

> *"I'm interested in the question of motivation of these hijackers, and my question is really directed to the agents. What have you found out about why these men did what they did? What motivated them to do it?"*

James Fitzgerald, an FBI Special Agent testifying at the 9/11 Commission public hearing, answered with the following response (Figure 42):

> *"I believe they feel a sense of outrage against the United States. They identify with the Palestinian problem, they identify with people who oppose repressive regimes and I believe they tend to focus their anger on the United States."*

Figure 42: What Motivated the 9-11 Hijackers – YouTube Video with James Fitzgerald (Uploaded by DanKGlassworksdotcom on August 28, 2010)

According to the creators of this video, "this testimony was kept out of the 9/11 Commission Report." Therefore, the creator of the video attempts to highlight the absence of this information while simultaneously trying to make this information available in the social media landscape.

The video continues with another video clip from a session on foreign policy held by the 9/11 Public Discourse Project on August 2, 2005, where "Lee Hamilton quickly tries to silence someone who asks why US support for Israel isn't being addressed." The questioner argues that Hamilton made a mistake earlier, claiming, "The Israeli-Palestinian dispute wasn't addressed in the 9/11 Commission Report." Then he refers to page 147 of the report, which says, "By his own account, **Khalid Sheikh Mohammed**'s animus toward the United States stemmed not from his experiences there as a student, but rather from his violent disagreement with **U.S. foreign policy favoring Israel**. p. 147, 9/11 Commission Report." The creator of the video then shows this quote from the 9/11 Commission Report highlighting the text shown in **bold** here (top screenshot in Figure 43). He then pleads, "Why aren't we addressing that sir?" and then goes on to mention that he gave Hamilton James Bamford's *A Pretext for War: 9/11, Iraq, and the Abuse of America's Intelligence Agencies*. Here the video shows a quote from this text highlighting the following parts: "…the causes of the September 11 attacks…**the conflict between Israel and Palestine was always at the heart**. 'It's central,' he said. 'It's not the only thing, but **it's the central thing**' p. 248, A Pretext for War."

The video ends with a final statement of why Representative Press created this video:

> *"There is a reason politicians don't want US support of Israel listed as a root cause of al Qaeda's terrorism. There is a reason politicians don't want the American people to 'reassess that policy.' Politicians lie to us about 'hatred of our freedoms' because they care more about serving special interests than about keeping us safe. Don't let them get away with robbing us of the freedom to decide for ourselves if we want to put our lives at risk over specific foreign policies."*

In the last part of this video, it asks viewers to "Please pass this video on to others. Help the campaign get these facts out to every American. Take action: representativepress.org/donate and representativepress.blogspot.com." The *Bill Moyers Journal* video, which is presented in the form of a professional documentary for educative and informative purposes, highlights the

numerous warnings that led up to the 9/11 attacks. This video, which is edited with a more persuasive tone and an action-oriented agenda, highlights what some believe to be one of the root causes of the 9/11 attacks in terms of the hijackers' motivation, which reflects the Israel-related events that appear in *The Road Through 9/11: A Chronology* and the *Complete 9/11 Timeline*.

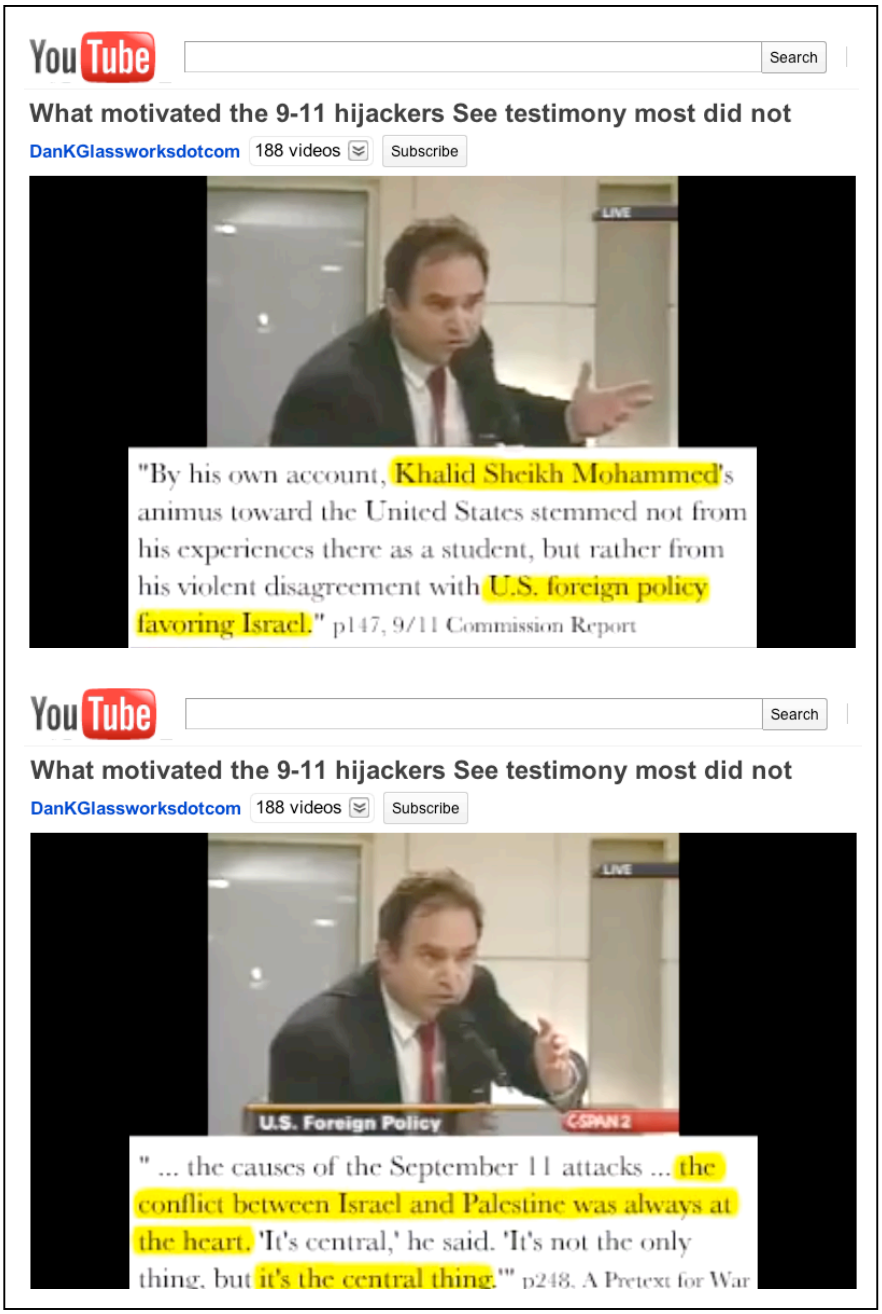

Figure 43: What Motivated the 9-11 Hijackers – YouTube Video with Questioner (Uploaded by DanKGlassworksdotcom on August 28, 2010)

What has also emerged in the aftermath of the 9/11 attacks is the "9/11 Truth movement," which is made up of individuals and organizations who collectively question and challenge the official narrative of the 9/11 attacks. People in this movement use resources like the *Complete 9/11 Timeline* to justify their inquiries. For example, Justin Martell, who founded the *Student Scholars for 9/11 Truth*, questions White House Press Secretary Dana Perino about 9/11 in an interview available on YouTube. In this video titled *Dana Perino Questioned about 9/11*,[145] screenshots are shown of the sources that Martell refers to during the interview to allow viewers to see the headline and source so that they can "verify it if they are so inclined" (Figure 44).

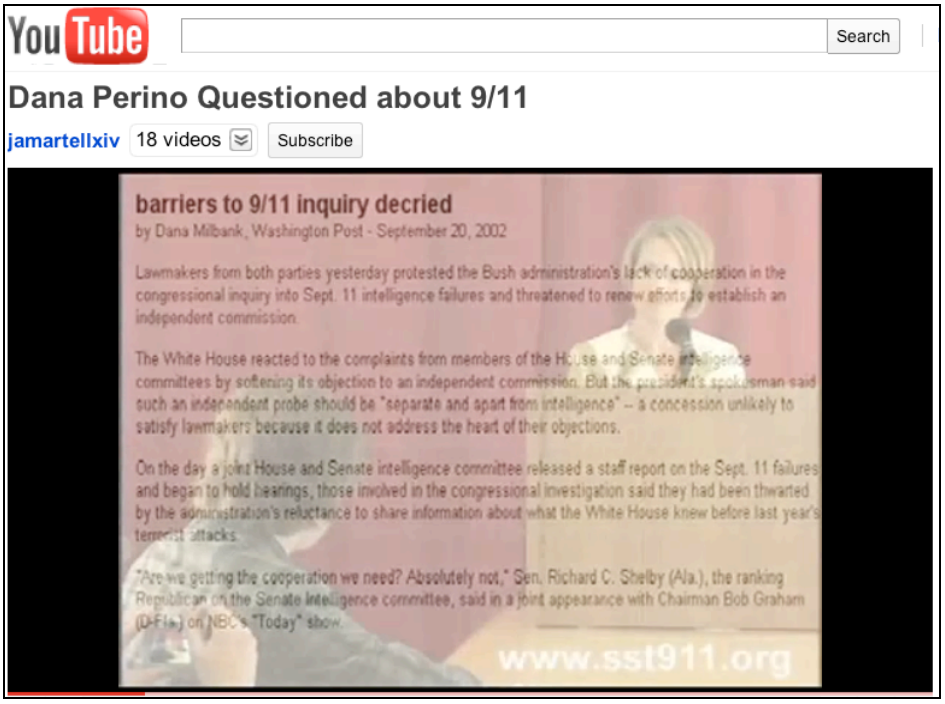

Figure 44: Dana Perino Questioned About 9/11 – YouTube Video with Justin Martell (Uploaded by Justin Martell on May 7, 2008)

After enumerating a series of sources pertaining to the Bush administration's inactions regarding the 9/11 Commission and the Congressional Joint Inquiry into 9/11, Martell finally asks, "Why the secrecy?" In addition to the immense amount of contradictory evidence pertaining to the cause of the 9/11 attacks, Martell speaks to the lack of compliance to the 9/11 investigations as

[145] http://www.youtube.com/watch?v=GeVX5zt8wEk

well as the lack of concrete and public answers about their knowledge of the 9/11 attacks. In an interview with Martell, he explains that he found the sources he mentioned in the *Complete 9/11 Timeline* at the History Commons site to prepare for this briefing. He further points out his perspective on the 9/11 Truth movement:

> *"The 9/11 Truth movement challenged the official narrative in all aspects—before, during, and after the attacks—to understand the who, how, and why aspects of the 9/11 attacks. But the movement became irresponsible and dishonest in its approaches to challenging this narrative. 9/11 truths came in with a preconception that it was an inside job and just tried to find evidence to support this claim, which further distorted the movement. Leaders of the movement also engaged in intellectually dishonest behavior. Now the movement is sidetracked."*

The movement is now made up of multiple organizations that are associated with this movement with the primary goal of uncovering the true nature of the September 11 attacks.

However, most people tend to believe the 9/11 Truth movement is made up of conspiracy theorists claiming that the 9/11 attacks was an "inside job." Current organizations, like the *9/11 Visibility Project*, attempt to move away from these theoretical claims and instead assert that 9/11 was a "false flag" operation. Frances Shure, who leads the *Colorado 9/11 Visibility Project*, explained in an email interview that the use of the term "conspiracy theory" has become problematic especially in the context of 9/11. She explains:

> *"First, a conspiracy is defined as any illegal or immoral action by two or more people. Therefore, both the official account of what happened on 9/11 and the claim of 9/11 being a false flag op are both conspiracy theories. We try to educate people to understand that there is the 'official conspiracy theory' and there is the 'alternative conspiracy theory.' The term 'conspiracy theory' has been used in our culture for some time as a derogatory term, which is meant to discredit anyone who holds such a theory—unless, of course, it is a conspiracy theory espoused by officials! The result is to stop any meaningful dialog by ridiculing the messenger with another (unofficial) theory that involves two or more people."*

Shure's statement points to the preconceived notions that people tend to have when presented with a counter-narrative that challenges the official 9/11 story. Instead, many of the narratives

presented in this chapter may be seen as conspiracy theories but they tend to be supported with empirical evidence. Ultimately, it is up to the listener to decide whether a certain theory of 9/11 justifies having a meaningful dialog or is just one of those outlandish claims.

The 9/11 Truth movement rhetoric is strong in the social media landscape in part because this movement was grown out of the internet and began at the time when blogs were gaining in popularity. Some of the most top viewed 9/11-oriented YouTube videos relate to the 9/11 Truth movement. For example, the video entitled *9/11: Total Proof That Bombs Were Planted In The Buildings!*[146] which was created by Lucus and uploaded by NufffRespect on April 3, 2007, is the most viewed video pertaining to 9/11 with over 20 million views and over 137,000 comments. It mashes up news clips from MSNBC, CBS, CNN, Fox News, and other TV news channels that show eyewitness accounts from news reporters, firefighters, and people near the World Trade Center. After the planes crashed into the twin towers and just before the towers collapsed, these eyewitnesses report that they heard bombs and explosions. In the caption of this video, it states:

> *"All of the individual news reports in this video can be found on YouTube and other video sites. This video shows that many actual 9/11 witnesses heard and saw explosions going off inside the towers, long before they actually fell. These witnesses include police, firemen and reporters. And what is even more shocking is the fact that all of this has been largely ignored by the mainstream media after the day itself. For those debunkers who wish to keep saying that the explosions were caused by gas lines, please save your breath. All of the three buildings that were blown up on 9/11 were all Class-A buildings. This means that gas lines were not permitted because the buildings had to comply with the safety regulations set out for Class-A buildings. So there were no gas lines!"*

The creator of this video was able find and filter TV news reports showing evidence of people mentioning the word "bomb" and "explosion" leaving the viewer to question what caused the WTC towers to collapse. The series of eyewitness reports broadcasted on mainstream TV news channels has become an important piece of evidence for understanding what people experienced

[146] http://www.youtube.com/watch?v=8n-nT-luFIw

in the midst of the crisis. Nate Schoman, one of the administrators for *The 9/11 Truth Movement* Facebook Cause, explains in an interview:

> *"Immediately after the WTC towers were hit, people began videotaping the news footage of the buildings falling and eyewitness accounts. It got archived and distributed and hosted in several locations. Because it was replicated thousands of times over the internet, which means you cannot erase the truth, which proved to be invaluable. Preservation of information is built into the internet as they get circulated and duplicated, quoted, reworked and formed elsewhere…they tend to take on a life of their own, they can't disappear, can't be erased…this archival aspect is the important part."*

In many ways, this top-viewed YouTube video, which mashes up and remixes eyewitness accounts from TV news reports, is precisely a manifestation of Schoman's remark regarding the preservation of this information. Moreover, much of the 9/11 content that pervades the social media landscape is these survivor accounts due to the excessive documentation of that day.

8.2 Surviving and Bearing Witness to 9/11

This section presents narratives from witnesses and survivors as well as narratives about the victims of 9/11. First I describe eyewitness narratives through visual artifacts, and then I present written witness stories. Last, I discuss the representations of spontaneous commemorations that emerged immediately after the 9/11 attacks.

8.2.1 Visual Witnessing the 9/11 Attacks

The memory of the 9/11 attacks is dominated by visual imagery, as this disaster is often described as the most photographed and videotaped event in history. It was through photos and videos that many others in the US and around the world were allowed to witness the attacks live through mainstream news outlets. At the same time, those who were at ground zero at the different locations of the attacks also used their own cameras to record this historic event in real-time. The destruction that unfolded on the morning of September 11th led to a visual fascination

that sparked the documentarian side of those who already carried personal recording devices. In this subsection, I present a sample of some of these images from the *Here Is New York* online archive and from videos uploaded to YouTube.

American Airlines Flight 11 was the first of the attacks, hitting the North Tower of the World Trade Center in New York. According to the *American Airlines Flight 11*[147] Wikipedia article, only a few people actually captured this plane hitting the North Tower on camera. Jules Clément Naudet captured it while making a documentary film on New York firefighters, a video that surfaced the next day on many news channels. Pavel Hlava, a Czech visiting New York at the time, happened to video record the skyline during the first plane crash, but it was only weeks later that he realized he had captured it. Last, Wolfgang Staehle had a low frame-rate webcam that also captured this crash through a series of photographs of the New York skyline.

After the first plane crash, news outlets began their live coverage of the attacks while many eyewitnesses on the ground began using their own recording devices to document what was initially thought of as a plane accident. As everyone continued recording the smoke and fires from the first plane crash, the second plane crashed into the South Tower. As a result, thousands of "born-digital" videos and photos were generated that captured this second crash, the first broad public documentation of its kind. After the second plane hit the WTC tower, people knew immediately that these plane crashes must have been deliberate and were not likely to be due to pilot error.

As people in and around Manhattan witnessed the devastation unfolding at the World Trade Center towers, people documented what they witnessed and how those around them were co-witnessing these events (Figure 45). It was only an hour or so later that those near the World

[147] http://en.wikipedia.org/wiki/American_Airlines_Flight_11

Trade Center would shift from being witnesses to being survivors and potentially victims from the collapse of these towers. Figure 46 is a photo that visually captures the tidal wave of destruction in the moment of the collapse in Lower Manhattan. This photo is a striking image that leaves the viewer to believe that the photographer felt compelled to capture the visual fascination of the collapse while also having to flee for his or her own life. Other photographers captured images of the survivors who were covered with dust from the collapse (Figure 47). These photographers not only witnessed the WTC attacks but also became victims of the WTC collapses.

Figure 45: Co-Witnessing the World Trade Center Attacks – Photo in *Here Is New York* Archive (Source: http://hereisnewyork.org/gallery/showbig.asp?photoID=1010)

Figure 46: Collapse of the World Trade Center Tower – Photo in *Here Is New York* Archive (Source: http://hereisnewyork.org/gallery/showbig.asp?photoID=3025)

Figure 47: Survivor of the WTC Tower Collapse – Photo in *Here Is New York* Archive (Source: http://hereisnewyork.org/gallery/showbig.asp?photoID=5130)

Videos of 9/11 also appear on YouTube and other video-sharing sites in amateur and professional documentaries. For example, the amateur video called *September 11 2001: What We Saw* documents the World Trade Center attacks from an apartment home at 41 River Terrace in Lower Manhattan (Figure 48). The videographers, Bri and Bob, originally chose to share this video via Revver[148] (a "viral video network that pays") on September 11, 2006; however, YouTube user NetworkLive chose to upload this video via YouTube[149] on December 29, 2006—which has received over 9 million views and over 55,000 comments thus far (Figure 48).

Figure 48: What We Saw Video by Bri and Bob
(Uploaded to YouTube on December 29, 2006; Source: http://www.youtube.com/watch?v=wNNTcHq5Tzk)

The following is the introductory caption that appears in this video:

> *"5 years ago today, we watched and filmed the attack on the WTC out of the window of home, 36 floors up and 500 yards away from the North Tower. Releasing this tape was a difficult decision for us because of its emotional and*

[148] http://revver.com/video/59686/september-11-2001-what-we-saw
[149] http://www.youtube.com/watch?v=wNNTcHq5Tzk

personal nature, and the potential for misuse. We feel, however, that our unique perspective has an important historical value, and shows the horror of the day without soundtracks or hype often seen in other accounts. Please be respectful of the contents of this account and be aware some may find the scenes on this video very disturbing. Please share only in its entirety. We chose Revver to distribute our video because of its artist-friendly licensing terms and support for the Creative Commons. Bob and Bri 9/11/2006"

Near the end of the film at 22 minutes and 20 seconds, Bri says, "This is the documentarian in me that feels like I need to record this." Just before she says this, a woman in the background mentions, "This happens every day in the Middle East. You think to yourself how lucky we are…Just imagine…during the war all these houses bombed." The experiences captured in this video reflect a few of the many emotions and reactions felt during and in the aftermath of the attacks. The attacks were a spectacle that compelled people like Bri to document the events in the moment and to recognize that their perspective would play an important role in recollecting what happened on September 11, 2001.

The second highest viewed video on YouTube is titled *Never before seen Video of WTC 9/11 attack*,[150] which received nearly 18 million views and over 88,000 comments. Jeremy Morrison uploaded this video on April 3, 2006, but someone he met over the phone when he was working as a technical support phone representative for a software company filmed it. This man mentioned he lived in an apartment "right across the street from the World Trade Center buildings" and that "he set up his camera on a tripod on his apartment balcony after the first plane struck," as stated in Morrison's website.[151] This man also had a personal blog where he had uploaded the video for friends and family to see, and he gave Morrison the URL to check out the video. Morrison decided to download it, post it on his own blog, and later post it on YouTube. In an interview with Morrison, he explained, "One of the things that really shocks me about the

[150] http://www.youtube.com/watch?v=J0Qu6eyyr4c
[151] http://jeremymorrison.com/wtcplane.html

video is its unedited nature and the ambient sound that was recorded then." He goes on to explain in an email interview, "YouTube can be a great resource for discovering non-mainstream media that helps one to better understand historical events and disasters." What has happened in the years following the 9/11 attacks is the reuse of raw amateur footage, like this video, as evidence to support empirically based claims of what happened on September 11, 2001.

One final example of a video found on YouTube is a montage of TV news broadcasts of the second plane, which struck the South Tower of the World Trade Center. The video is titled *September 11, 2001 – As It Happened – The South Tower Attack*[152] and was uploaded by aaronman01 on August 30, 2007. The video is an excerpt from a DVD called *September 11, 2001 – As It Happened – A Composite* and includes the following information in the caption:

> *"This segment is comprised of a succession of newscasts that feature the impact of Flight 175 into the South Tower as it happened LIVE at 9:03 AM. This segment documents and preserves how just about each and every network covered the moment the South Tower was struck on live television. Included are clips from ABC News, CBS News, WNYW-TV (Channel 5, New York), WNBC-TV (Channel 4, New York), NY1 (New York One, All News), Fox News Channel, WCBS-TV (Channel 2, New York), WPIX-TV (Channel 11, New York)... Also included in this segment are four NON-BROADCAST angles of the impact of Flight 175 into the South Tower. They are included here for completeness and utilize audio from NPR Radio from the morning."*

Some "9/11 Truthers" would argue that this is a rare montage of live television newscasts of the 9/11 attacks, since these breaking news bulletins are said to be difficult to obtain directly from TV news stations. These 9/11 Truthers sometimes use these news clips as empirical evidence on which to base their claims that tend to go against the official 9/11 story.

Another open archive has recently emerged specifically for 9/11. In September 2009, the National September 11 Museum and Memorial team built and launched the *Make History*[153]

[152] http://www.youtube.com/watch?v=1lKZqqSI9-s
[153] http://makehistory.national911memorial.org/

website, which allows individuals to share their photos, videos, and personal stories related to 9/11. What this site emphasizes is that participating in the documentation of 9/11 allows visitors to also participate in the making of history. Unlike the *September 11 Digital Archive*, this site presents the photos, videos, and stories using a map and timeline interface. Figure 49 and Figure 50 are screenshots of two photos that appear in the *Make History* archive. At the bottom of each screenshot, a digital map appears on the left and a timeline specific to 9/11 appears on the right. The photo taken on 9/11 appears at the center overlaid on top of an image taken from Google Street View of that same location and direction. In an interview by Wright (2010), Jake Barton, the interaction designer who built *Make History*, provides the following explanation of what he believes were the major design challenges he faced:

> *"…the main challenges for 911history.org [Make History] involved making a project that really spoke to where we are now, somewhere between 9/11 as a raw and recent event, and 9/11 as a receding historic moment. For many, the events of 9/11 are still very much present, a daily reality of grief and pain, while others have seemingly moved on and give it little thought. We wanted Make History to match this moment when the past and present are starting to become distanced, and so we turned to overlaying historic photos over street-view images of the present, giving a 'double exposure' that speaks to where we are right now. Further, this technique underscored that history was made in the same streets and roads all around New York City, the other sites, the nation and the world. At many churches or mosques or city halls, historic vigils linked communities together, and these were also historic events."*

The juxtaposition of a historic image with a present-day image of the street taken in the same location is an attempt to link the past to the present and potentially engage the viewer in a different way than other 9/11-specific archives. Still, the *Make History* viewership is quite different than the viewership that comes across 9/11 artifacts in social media services like Flickr and YouTube with other limitations that do not support Web 2.0 features like commenting.

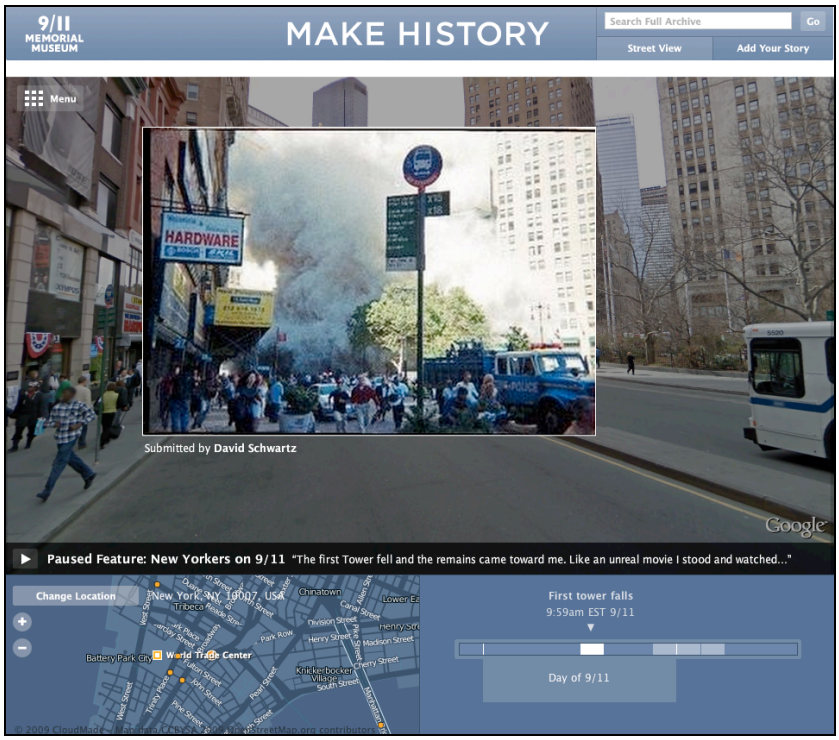

Figure 49: First Tower Falls – Photo in *Make History* Archive

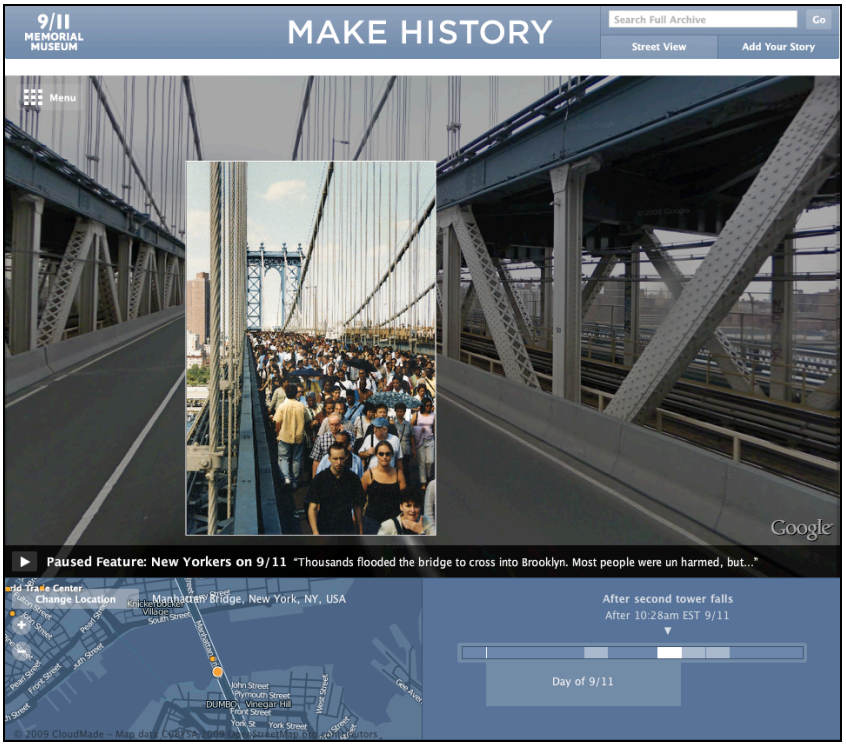

Figure 50: Thousands Flooded the Bridge – Photo in *Make History* Archive

The thousands and possibly millions of photos and videos taken on September 11, 2001, from multiple people and points of view are now prosthetic memories for those who did not experience the attacks firsthand. They are visual artifacts that allow people to relive these shocking moments from multiple vantage points and allow people to see what others experienced in particular locations on 9/11. These photos and videos appear in popular social media services like Flickr and YouTube, but they also are being redistributed through blogs and other websites. Additionally, these visual artifacts have played an important role for those questioning the official 9/11 narrative by reusing these artifacts as forensic evidence.

According to Michelle Delaney who manages the Photographic History Collection of the *September 11 Bearing Witness to History* exhibit at Smithsonian's National Museum of American History, "The imagery of September 11 is so powerful. The visual nature of that day is important historically...Photography is how we all remember that day."[154] As she points to the importance of photos, she asks, "Why [did] people [leave] their homes with their cameras in hand to document—why did the individual feel it was important to photograph?"[155] The motivation for taking photos in the midst of the attack seems warranted, as people were fascinated by the utter destruction caused by the attack, but the excessive documentation in the aftermath of 9/11 made some question the act of photographing this crisis. For example, Figure 51 is a photo of a sign that appeared all around the Manhattan area where other signage was posted. The following statement appears on this sign:

> *"I wonder if you really see whats here or if you're so concerned with getting that perfect shot that you've forgotten this is a tragedy site, not a tourist attraction. As I continually had to move 'out of someone's way' as they carefully tried to frame this place mourning, I kept wondering what makes us think we can capture the pain, the loss, the pride and the confusion—this complexity—into a 4 x 5 glossy. I ❤ [heart] my city – FireGirl, NYC, 09-17-01"*

[154] http://americanhistory.si.edu/september11/collection/transcript.asp?ID=24
[155] http://americanhistory.si.edu/september11/collection/transcript.asp?ID=26

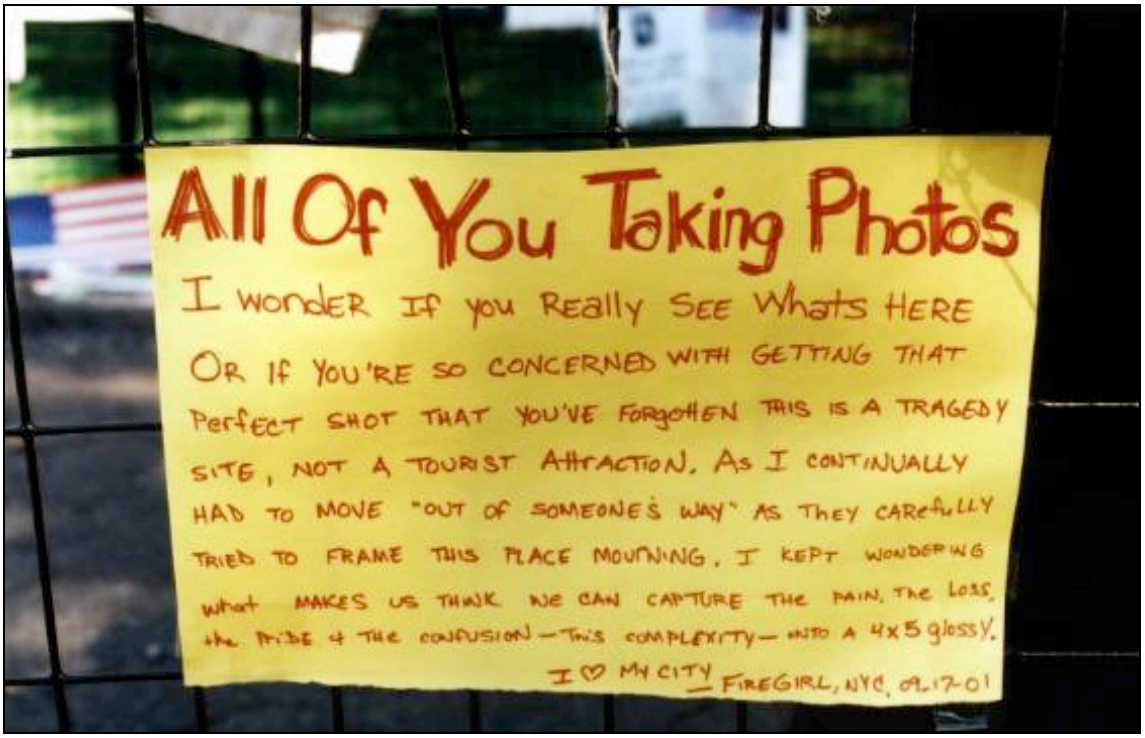

Figure 51: All Of You Taking Photos – Signage in *Here Is New York* Archive (Source: http://hereisnewyork.org/gallery/showbig.asp?photoID=2308)

The urge to take photos of historic sites may exist for a multitude of reasons, depending on one's association to the site and event. FireGirl raises an important point as to the preoccupation of documenting rather than mourning in the immediate aftermath of a crisis like 9/11. Although the 9/11 attacks spurred a visual fascination and obsession to take photos, the experiences of witnesses were also rich in a text-based format.

8.2.2 Written Survivor and Witness Accounts

As opposed to the visual accounts of 9/11, written accounts from survivors and witnesses of the 9/11 attacks sometimes provide a more personal and emotional description that would not be easily depicted in a photograph. Here I present examples of stories that appear in the *September 11 Digital Archive* from survivors and those who witnessed the attacks from afar.

Many different types of "born-digital" artifacts (e.g., stories submitted to the digital archive, emails, digital photos, etc.) were submitted to the *September 11 Digital Archive*. The following is an example of an email[156] submitted to the archive on August 19, 2002:

> *"-----Original Message-----*
> *From: Kailian, Sonia*
> *Sent: Tuesday, September 11, 2001 10:31 AM*
> *Subject: okay for now*
>
> *For anyone who is trying to get through and call, I am alive and okay. I was right outside the WTC when the first bomb/plane exploded. I ran to my building and now they are telling us not to leave bc it is the safest place to be, there is a thick white fog outside of smoke and they shut the air ducts to my building. Everyone is watching it on tv in the conference room but i can't it's making me sick.. I am freaking out bc I can't get through to anyone. Has anyone heard form Murph, Katie, and Becky? Please let me know. I'm scared."*

This account provides a glimpse into one person's account of what she experienced at the base of the WTC towers when the first attack occurred and how she was able to survive immediately after this attack.

Another "born-digital" story by a sergeant[157] with the New York Police Department (NYPD) was submitted to the *September 11 Digital Archive* on July 30, 2002. The following is an excerpt of his experience on September 11:

> *"I got to the WTC shortly after the second plane hit…I was going south on Church Street, the east border of WTC near Fulton Street when the South Tower collapsed. I hid behind a NYPD-ESU truck (REP) with a few others. The debris peppered the truck almost severing the hand of the person next to me. The most dangerous moment was the dust. I've been told that each floor of the tower had a million pounds of concrete. When that dropped on me ALL SIGHT AND SOUND WENT AWAY. I was holding my breath, peeking through my fingers. The lack of sight was rough, but the lack of sound was worse. Only a few seconds before was the loudest noise you've ever heard. Now, because it was so quiet, I thought I was the only person alive in NYC. I went to take a breath. I can only say it was like putting your face in a bag of flour, sealing it around your face and breathing. The dust filled my throat and lungs completely. Now I was sure everyone was dead*

[156] http://911digitalarchive.org/parser.php?object_id=43406
[157] http://911digitalarchive.org/parser.php?object_id=40336

> *and I was about to die also. I tried using my hankie to breathe with little positive results. I then pulled my suit jacket right over my head and wrapped it tight around my face. That helped greatly. I knew the truck I was behind faced south. I felt it and oriented myself north and started crawling. At Barclay and Church Sts. a kid named Jonathan Stewart, from a nearby High School, pulled me into St. Peter's Church. In the church were 4-5 others with more coming in. We cut strips of priest's robes and altar cloths so that people had face masks and bandages."*

This story provides a rich description of his sensorial experience being covered with dust from the collapse of the WTC towers. He goes on to further describe how he crawled to safety, how a high school student helped him, and how they created makeshift face masks and bandages to help others in need.

One final example of a "born-digital" artifact submitted to the *September 11 Digital Archive* is a story from a high school English teacher.[158] The following is an excerpt of the teacher's story submitted on August 24, 2002:

> *"…I needed to go to my classroom to face my students. I didn't even consider not turning on the television in my classroom. I needed to watch, and understand, and, also, to help a classroom full of 15-year-olds do the same. Some students had heard the news in their first period class; others hadn't. We shared what we knew for fact, wondered about all we didn't. Every single student understood the gravity of the situation without a 'talk' or message from me. They asked meaningful—and heartwrentching—questions as they searched for some meaning. By the time the second tower crumbled, the enormity of the tragedy was too much for some and we could no longer hold back tears. We quickly learned how little we knew about Bin Laden, Al-quida, and Afghanistan. And how little we understood others' views of the world and of the US. As the day went on, each of my classes reacted differently. Some classes wanted to talk about what was happening, others were overwhelmed and wanted a 'normal' hour of class, get another wanted 'an update, please' and then quiet time to reflect in journals. Although the school day finally ended, the effects of the tragedy and the emotional drain continued much longer." [sic]*

This story is one of many from teachers and students all across the nation, where many of them describe watching the attacks on TV in a classroom. In this story, the teacher describes the

[158] http://911digitalarchive.org/parser.php?object_id=44886

bewildering experience of witnessing the 9/11 attacks in a classroom setting and sometimes having to turn this horrific event into a teachable and educative moment in some way.

In the *9/11 Generation* Facebook group, there were similar accounts of what people remembered and experienced on 9/11 particularly when they were in school. For example, Lily Davidson[159] shares the following wall post on January 6, 2010:

> *"I was in kindergarden. I remember my Primncipal coming on and saying Attention: The World Trade Center has been bombed. Please let all students call home. Ifound my sister in the hallway and we went outside to see my Dad. We listened to the reports. I was to young to understand. My Dad told me that some planes flew into big buildings and I got scared. I was 5 then. 9/11 was 5 days after my birthday." [sic]*

There are many Facebook wall posts in the hundreds of 9/11-related Facebook groups that re-present these memories of learning about 9/11 in a school environment.

8.2.3 Spontaneous Commemorations

Some of most striking photos that emerged from those who witnessed the immediate aftermath of the attacks in Manhattan were photos on the missing person flyers posted around public spaces in Manhattan. They each were crafted to provide information to identify a missing person. They typically included a personal photo, a physical description of notable accessories like a special ring or tattoo, a work location in the WTC towers, or other information about how the missing person might otherwise be located. They appeared en masse at subway stops, in Union Square (Figure 52), at popular restaurants (Figure 53), along public phone booths (Figure 54), and in other highly convergent places around the city.

[159] http://www.facebook.com/crissangellover15/posts/235937976540

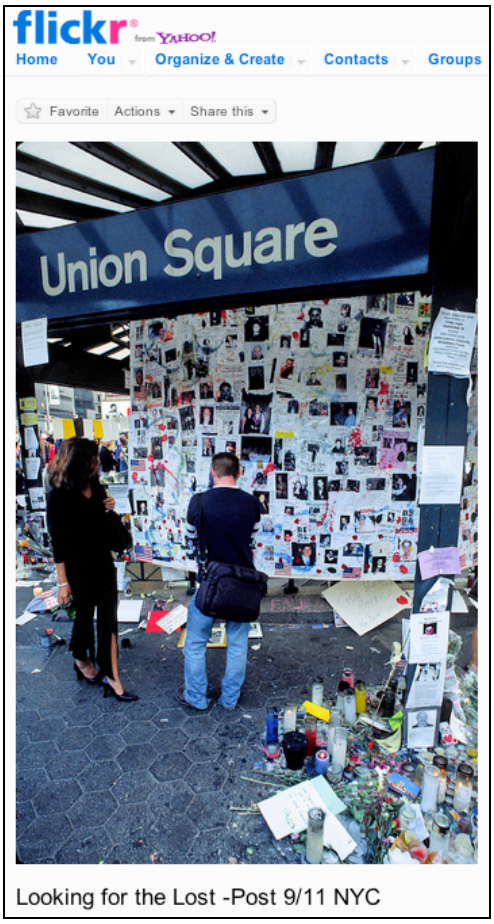

Figure 52: Looking for the Lost -Post 9/11 NYC – Flickr Photo
(Uploaded by John Reilly-NYC on September 12, 2009 Taken Days After 9/11)

Figure 53: Missing Person Flyers at Ray's Pizza – Photo in *Here Is New York* Archive
(Source: http://hereisnewyork.org/gallery/showbig.asp?photoID=5903)

Figure 54: Missing Person Flyers at a Phone Booth Photo in *Here Is New York* Archive (Source: http://hereisnewyork.org/gallery/showbig.asp?photoID=741)

Over time these flyers collectively became spontaneous memorials, giving tribute to the many who lost their lives on 9/11. Many New Yorkers remembered the strong sense of solidarity and cohesion that immediately occurred after 9/11, where people would acknowledge each other in the streets of New York. The missing persons flyers of those who perished that covered the public places in Manhattan were daily reminders that made people want to connect with other New Yorkers who were also mourning and trying to make sense of this tragedy. As New Yorkers walked by these flyers trying to get back to their daily routines (e.g., going to work, walking the dog, etc.), their pace slowed down and the urge to commemorate became stronger. Although these missing person flyers have now disappeared from New York City's physical landscape, the memories of them are still found in the digital photos shared online in sites like Flickr and the *Here Is New York* online archive as well as in videos on YouTube.

The missing person flyers sparked the spontaneous commemorations that pervaded the streets of Manhattan in the days, weeks, and months following the WTC attacks. Such commemorations also appeared around the world in the immediate aftermath of 9/11. For example, a YouTube video titled *World reaction to 9/11*[160] is a montage of photos capturing commemorations that took place in the following countries and cities: Canada, Croatia, India, Jordan, Moscow, England, Germany, Albania, Italy, Kosovo, Prague, Jerusalem, Norway, New Zealand, London, Poland, Japan, Korea, Macedonia, Minsk, Finland, Denmark, Berlin, Russia, Sydney, and Columbia. This was Barry's first video using Windows Movie Maker. In an email interview with Barry, he explains how he looked for pictures on the web and noticed that most of them were of the planes hitting the towers. He wanted people to see another side of 9/11. He goes on to mention, "what touched me was the way the world reacted. The outpouring from the rest of the world showed me, that for a little while anyway, we weren't alone." The following are some of the comments on this video:

> *This video shows the innate goodness of people all around the world, who look past nationality, religion, and race to comfort others in their time of loss. – TsukasaElkKite*
>
> *It is a shame that at one point our country held the support and sympathy of the world only to have lost it to misguided policies and greed. The greed and arrogance of George W. Bush and his cronies squandered an opportunity to lead the world in such a way that those responsible for the 9/11 attacks would be held accountable and the scourge of terrorism would be wiped off the earth. I don't believe that Mr. Obama is capable of undoing the damage that Bush has done. – robertmmm7*
>
> *As I sit here and watch this video, I am visibly moved. The people that died in the US that day were not just Americans, they were from all over the world but they were united on the soil that stands for freedom and democracy. They were united and stood together as they fell for the liberties of their families, children, mothers. The sounds, smells, sights and tears that I experienced and the emotions I shared and still share with a world of people will forever stay ingrained in me.– skoroyob*

[160] http://www.youtube.com/watch?v=lZiHN3z2o08

> *We have seen something that no other generation has seen. The World United. Not once, but twice. We were attacked and the World united behind us. We had the power to bring so much good to the World and our leader used it to further his own personal agenda. – sastath*
>
> *Damn, if you think about it, it's actually sad that not all of the countries in this video feel the sympathy for us Americans now as they did right after 9-11. And times changing isn't the reason for that. It was the invasion of Iraq. After 9-11, no one blamed us for invading Afghanistan, but many of these countries, like India, don't feel the sympathy they did before the Iraq war, and theta war is the reason. – pistonsfan1432*
>
> *As an American, it's truly moving to see a video like this. A world in mourning... Other Americans need to see this... Bless all these nations for coming together as one in times of crisis, supporting fellow human beings. A day nobody will forget. – 17107Jon17107*

The video reflects the global sense of empathy and mourning that occurred immediately after the 9/11 attacks. Yet, the video was uploaded on August 16, 2008, allowing viewers to juxtapose these images taken immediately after 9/11 with what has happened over the preceding seven years and beyond. The strong sense of solidarity around the world and the stories people shared in the immediate aftermath were vital to healing, as one participant explained. However, many still question the actions that have been taken in response to the attacks, as reflected in the comments above. The next section discusses these actions and the other ongoing crises that have resulted from the September 11th attacks.

8.3 The Ongoing Effects of 9/11 Today

With the September 11th attacks having occurred nearly a decade ago, the impacts and ramifications of the September 11th attacks still continue. As the reference to "9/11" persists in both mainstream and social media, the memory of 9/11 is taking on new meanings in the context of current 9/11-related events. The previous section presented narratives that reflect much of what people tend to remember about 9/11 and it has been the focus for professional historians and curators working on archives related to the September 11th attacks. According to Helena

Wright,[161] Curator of Graphic Arts in the Division of Information Technology & Society at the Smithsonian, she states in the "Curator Stories" webpage of the *September 11: Bearing Witness to History* collection at the National Museum of American History at the Smithsonian:

> *"As historians we normally have a period of reflection when we evaluate what's happening. We're not really involved in current events—it's rather contradictory to what historians do. Usually some time elapses before we can evaluate and determine what's to be brought into a collection. So in that sense the immediacy of this situation is quite unusual. It does feel different. There is a kind of rush to make sure that we actually do capture and acquire what we need to before it's either destroyed or disappears."*

As curators like Wright engaged in their own form of "quick response" to collect ephemera in the immediate aftermath of the attacks, more attention was placed on what happened that day. Despite the fact that we reference this event by the actual date itself, 9/11-related collections sponsored by official museums still tend to focus on the day of 9/11. For example, the National September 11 Memorial and Museum recently promoted their *Interactive 9/11 Timeline*,[162] which only chronicles the series of attacks on that day amidst other key occurrences.

However, the memory of 9/11 has since expanded during the past 10 years of reflection. People have widened their scope of what 9/11 means by not only including the history and presumed causes of the 9/11 attacks, as discussed in Section 8.1, but also including the events that have happened since the attacks in 2001. The reactions to these recent and current events are some of the ongoing narratives that pervade the social media landscape. This section presents a couple of these ongoing narratives. First, I present reactions to the "war on terror" narratives. Then, I present narratives related to the long-term health effects after the collapse of the World Trade Center towers.

[161] http://americanhistory.si.edu/september11/collection/transcript.asp?ID=36
[162] http://www.national911memorial.org/site/PageServer?pagename=New_History_Timeline

8.3.1 "War on Terrorism"

In response to the September 11th attacks, the former US president George W. Bush declared the "war on terrorism." On September 20, 2001, he specified his intentions in his address to Congress:

> *"Our enemy is a radical network of terrorists and every government that supports them. Our war on terror begins with al Qaeda, but it does not end there. It will not end until every terrorist group of global reach has been found, stopped and defeated."*

Although many operations or wars have been waged under the war on terror objectives, two wars are primarily associated with 9/11, namely, the War in Afghanistan that began on October 7, 2001, and the Iraq War that began on March 20, 2003. What follows is a sample of the reactions to the "war on terrorism" narrative in the social media landscape.

In a Facebook group titled *9/11 Generation*, Ian Phillip McCann[163] shares his opinions regarding the perpetrator of the 9/11 attacks and the pretext for waging the war on terror:

> *"September 11th was committed by Terrorist lead by Bin Laden who was offended by American soldiers stepping onto Arab soil during the Gulf War. It is insulting to hear that people actually believe that this crime was committed by our own Government. --- If Bush had not gone to Iraq we could have probably caught Bin Laden by now. Instead over 60% of our troops looking for him got moved to Iraq." – September 13, 2009*

McCann's wall post reflects his reaction to the claim that "9/11 was an inside job," which is just one of many "9/11 truth" claims that pervade the social media landscape. He also asserts that the Iraq War was a diversion preventing the US from accomplishing the objectives of the war on terror.

In a blog post titled *Has the War on Terror Been A Success?* on a blog related to the 2012 Republican campaigns, Doug Forrester[164] posted the following on November 29, 2009:

[163] http://www.facebook.com/ian.mccann1/posts/131661181540

> *"We've disrupted and degraded terrorist networks. This greatly improves our odds of stopping the big dramatic attacks that we all remember and mourn from 2001…Meanwhile in Afghanistan we've overturned a government that was complicit in attacking us. While victory here is less striking than in Iraq it is no less certain. Whatever the outcome in Afghanistan we've limited the reach and power of the terrorists who used Afghanistan as their base…it seems very clear that the terrorist goal of an Islamic Caliphate is now even more unlikely. With all these accomplishments I don't think it hasty to say that the War on Terrorism begun in late 2001 with all its flaws and all its tragedies is already a success."*

Forrester's post portrays a somewhat simplified response as to why he believes the war on terror has been successful. The blog post discussed next asks nearly the same question but responds with a much more in-depth explanation using data from scientific studies to support his claim.

Shane Leavy, an Irish freelance journalist, created a blog post titled *Did the War on Terror work?*[165] on May 16, 2010. His rather extensive set of replies to his own question is accompanied with graphs from several scientific studies (i.e., The National Consortium for the Study of Terrorism and Responses to Terrorism's (START) Global Terrorism Database, Europol's 2010 EU Terrorism Situation and Trend Report, the Center for Systemic Peace research reports, and the RAND Corporation's 2008 research brief titled "How Terrorist Groups End"). For example, Leavy refers to the graph shown in Figure 55 to illustrate "a startling trend: terrorism hit a peak in 1992 and collapsed after that. The end of the Cold War coincides with a dramatic decline in terrorism." The graph also illustrates "a significant increase in attacks after 9/11," particularly after the Iraq War began in 2003. Leavy further points out that "a goal of Al Qaeda was to use 9/11 as a spark to detonate a wider Muslim revolution that would overthrown [sic] secular government and establish an Islamic Caliphate." What this study shows is that only a small increase in Muslim terrorist activity occurs the year after 9/11.

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[164] http://race42012.com/2009/11/29/has-the-war-on-terror-been-a-success
[165] http://shaneleavy.blogspot.com/2010/05/did-war-on-terror-work.html

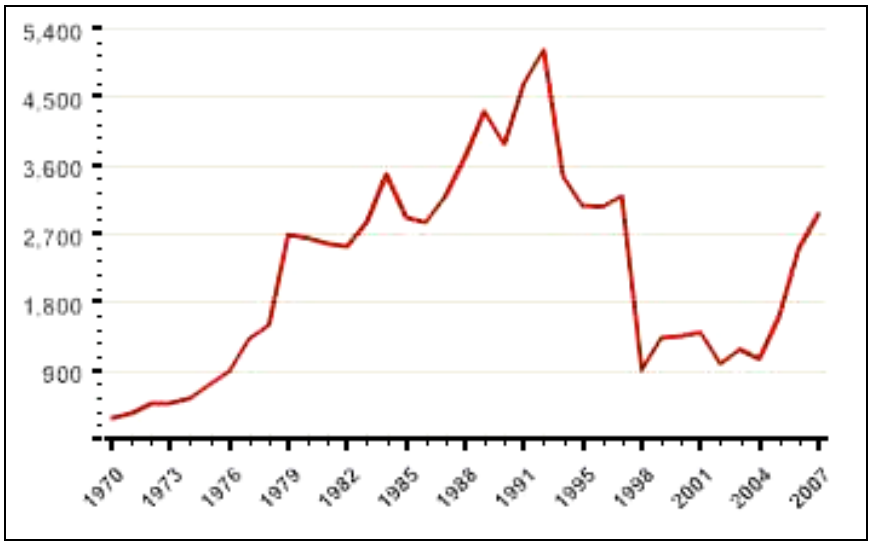

Figure 55: Graph from Global Terrorism Database as shown in Shane Leavy's Blog Post on May 16, 2010

Another argument that Leavy makes in his blog post is based on the RAND Corporation's study on "How Terrorist Groups End." The study looked at 648 terrorist groups between 1968 and 2006 and found that 43% adopted nonviolent tactics and joined the political process, 40% were destroyed by law-enforcement agencies that arrested and killed key members of the group, 10% achieved victory, but "**only 7% are destroyed by military force**"—as Leavy emphasizes in his blog post to legitimate why he believes the military method used by the US government after 9/11 was failing. Leavy concludes with the following statement:

> *"But so far the War on Terror has not eliminated international terrorism. It coincides instead with a widespread increase of terrorist violence, particularly in Iraq. Either the War on Terror has had no impact, has made things worse, or is thus far incomplete."*

Leavy's bleak perspective, which provides a macro and seemingly objective view regarding the effects from the "war on terror," is legitimatized with findings from scientific studies.

Lastly, in the *9/11 Generation* Facebook group, Jill Jiggles Wheable[166] created the following wall post on March 2, 2010:

> *"I am ashamed to say that as a human and as an individual I witnessed 9/11. I cannot condone, I cannot hate and I can feel so much pity for those who feel the anihalation of others is 'good'. God rest ALL our souls xx P.S. My father is Jewish, My mother is Christian, I am Pagan and my Partner is Muslim, and we all get on great! xx"*

Wheable's post speaks to the anti-Muslim and Islamophobia fervor (discussed further in Section 8.5.3) that has developed as a result of the war on terrorism taking place predominately in the Middle East against terrorists in that region. In a "post-9/11 world," the political effects of these attacks continue to reverberate in ongoing narratives about terrorism. Yet, 9/11-related health issues are also becoming more pervasive.

8.3.2 Long-Term Health Effects

Immediately after the World Trade Center towers collapsed, tidal waves of dust blanketed Lower Manhattan. This dust cloud contained more than 2,500 contaminants including arsenic, lead, asbestos, chromium, benzene, and PCBs.[167] On September 18, 2001, Christine Todd Whitman, Administrator of the Environmental Protection Agency (EPA), announced in a press release:

> *"We are very encouraged that the results from our monitoring of air-quality and drinking-water conditions in both New York and near the Pentagon show that the public in these areas is not being exposed to excessive levels of asbestos or other harmful substances…Given the scope of the tragedy from last week, I am glad to reassure the people of New York…that their air is safe to breathe and the water is safe to drink."*

[166] http://www.facebook.com/Purplemisty/posts/335167196540
[167] http://www.911studies.com/asbestos.htm

However, documents in the social media landscape claim that many of the EPA statements were not based on scientific evidence but rather based on alterations that had to be cleared by the Council on Environmental Quality (CEQ) at the White House.

In a news clip by CNN on August 27, 2003, posted to YouTube by CoreOfCorruption[168] on August 26, 2009, the CNN reporter states that in a report the White House convinced the EPA to "add reassuring statements and delete cautionary ones." This issue also appears as an event titled "(September 12, 2001-December 31, 2001): White House Dictates EPA Press Releases" in the *Environmental Impact of 9/11 Attacks*[169] timeline in the History Commons site. In the documentary film *Dust to Dust: The Health Effects of 9/11*[170] uploaded to YouTube, former Inspector General of the EPA Nikki Tinsley explains, "We were told that the CEQ has a desire to protect the national security and to get Wall Street open and that was the reason that the press releases were changed." One example of a statement that was deleted was as follows: "the concern raised by these samples would be for the workers at the cleanup site and for those workers…returning to their offices." With this deletion and with New Yorkers reassured about the air quality by EPA officials, people were allowed to go back to work on Monday, September 17, 2001, and cleanup efforts at ground zero immediately resumed.

Since the EPA gave the impression that the air quality in Lower Manhattan did not pose a health hazard, people were not given proper respirators or mandated to wear any safety equipment. Photos in Flickr (Figure 56) and in the *Here Is New York* archive reveal that some people wore respirators, others wore surgical face masks, and some wore nothing over their face.

[168] http://www.youtube.com/watch?v=qHAAogP3K-4
[169] http://www.historycommons.org/project.jsp?project=enviromental_impact_911_attacks
[170] http://www.youtube.com/watch?v=x3YcxWFs6jA

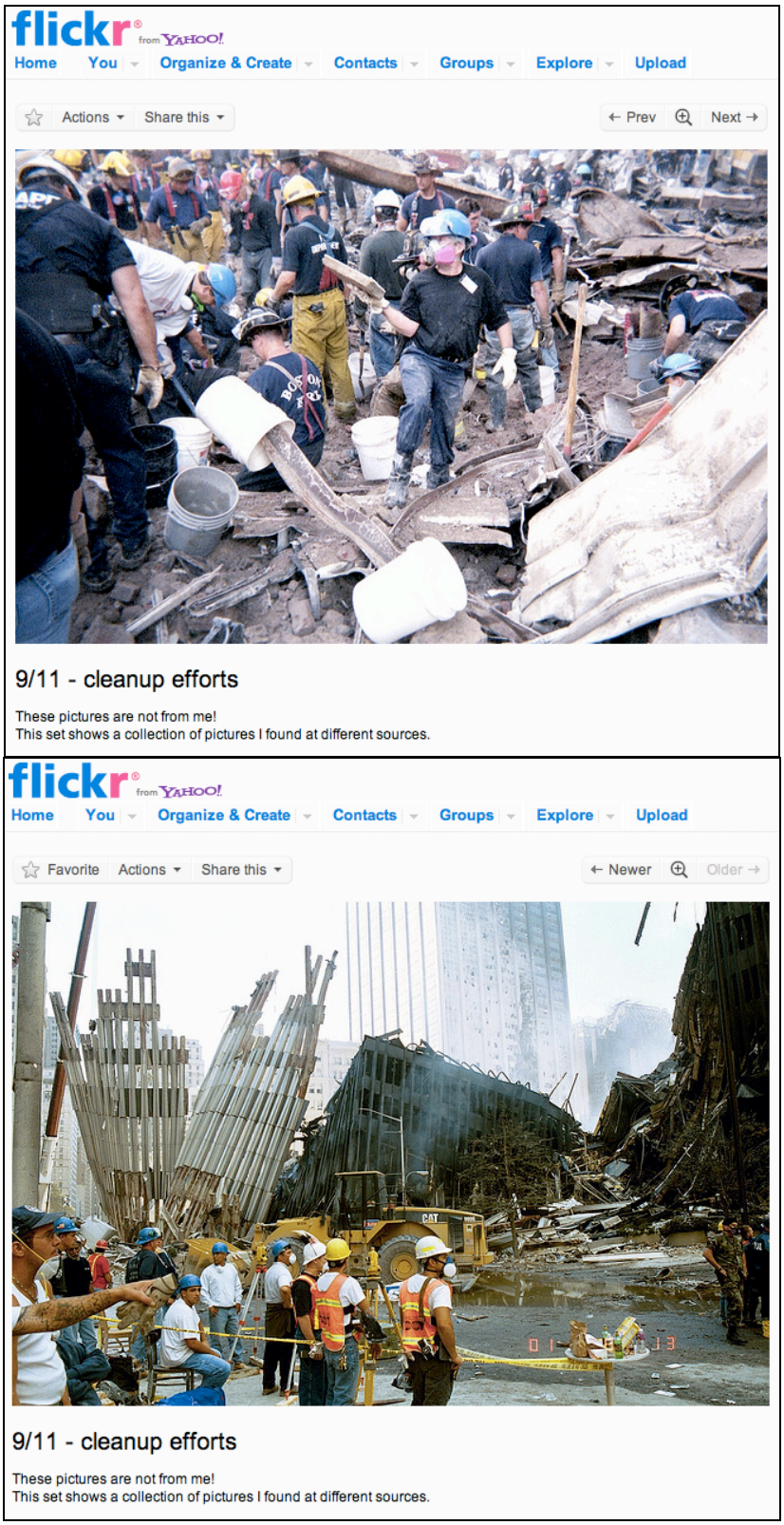

Figure 56: 9/11 Cleanup Efforts Flickr Photos
(Uploaded by Robert-P. Pelikan on February 4, 2008)
(Source: http://www.flickr.com/photos/dareware/2243105756 [top] and http://www.flickr.com/photos/dareware/2243147827 [bottom])

In the months and years after 9/11, emergency responders, workers helping with the cleanup effort, volunteers, and Lower Manhattan residents began to develop long-term illnesses and particularly Chronic Obstructive Pulmonary Disease (COPD), a general name for a group of lung diseases including emphysema, chronic bronchitis, refractory asthma, and bronchiectasis. According to Herbert et al.'s (2006) "The World Trade Center Disaster and the Health of Workers: Five-Year Assessment of a Unique Medical Screening Program" report, the WTC Worker and Volunteer Medical Screening Program conducted at Mount Sinai School of Medicine between July 2002 and April 2004 found that "60% of 9,442 responders reported new or worsened respiratory symptoms while performing WTC work." This September 2006 report proved the ramifications of the "World Trade Center cough" through scientific studies. The death of NYPD officer James Zadroga on January 5, 2006, at the age of 34 also became the touchstone for linking a death of a 9/11 responder to the toxic substances at ground zero.

With the growing long-term health concerns in 2006 about the debris resulting from the WTC attacks, this presumably led to the creation of the *Health effects arising from the September 11 attacks*[171] Wikipedia article on November 4, 2006. Other social media artifacts have increasingly been created and shared regarding the long-term health effects of 9/11. In the *9/11 List-Serv* Google Group, the manager sent a message titled "16 YouTube videos: EPA & Post 9/11 Air Quality" on June 26, 2007. Many of these YouTube videos are C-SPAN recordings of the judiciary hearings on the post-9/11 air quality and testimony from former EPA Administrator Christine Todd Whitman; however, some videos are no longer available on YouTube. The other 9/11 health-related messages in this group consisted mostly of updates on the 9/11 Health and Compensation Act/Bill. In Flickr, the user NeverForget 911 uploaded a

[171] http://en.wikipedia.org/wiki/Health_effects_arising_from_the_September_11_attacks

series of photos that were of former firefighters, paramedics, custodians, volunteers, students, and others in and around ground zero who are suffering from long-term health conditions. Figure 57 is a Flickr photo[172] of Marvin Bethea, former NYC paramedic, showing the 15 prescription medicines that he now must take every day. Figure 58 is a Flickr photo[173] of Lucelly Gil, a former cleaning person for buildings around ground zero after 9/11, holding the medications she now must take due to illnesses caused by cleaning up the dust and debris.

Figure 57: Former NYC Paramedic Who Got Sick From His Exposure on 9/11 – Flickr Photo (Uploaded by NeverForget 911 and taken on May 30, 2006)

[172] http://www.flickr.com/photos/59218746@N07/5475760925
[173] http://www.flickr.com/photos/59218746@N07/5478210891

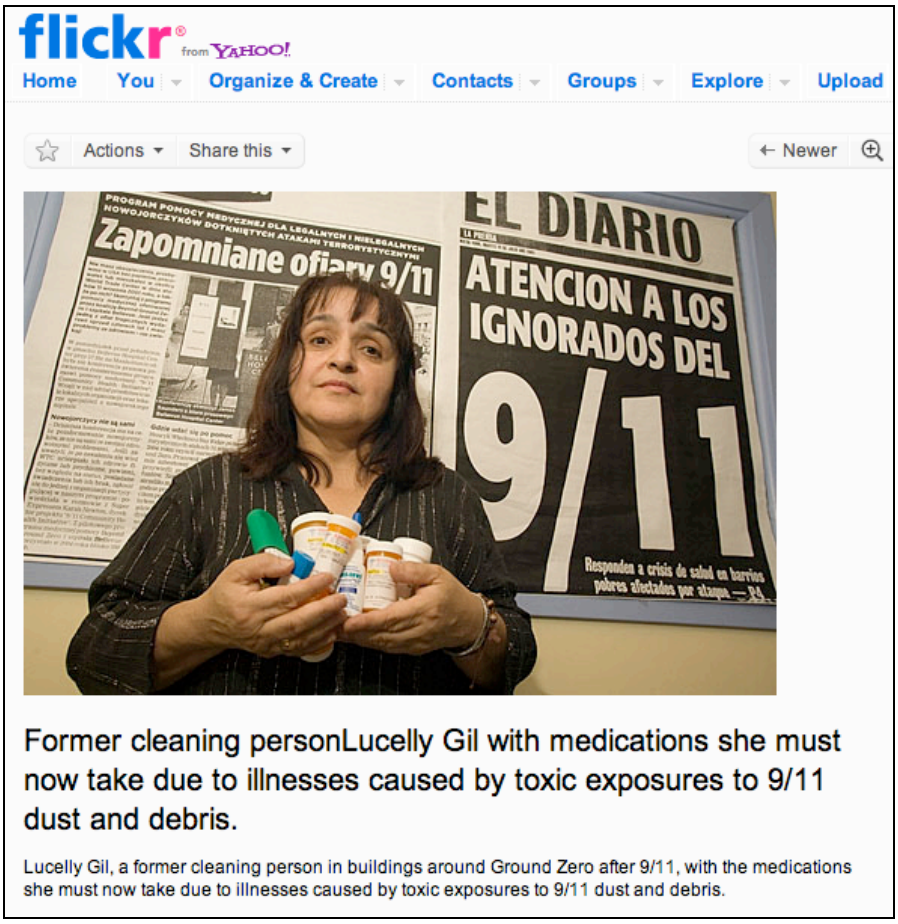

Figure 58: Former Cleaning Person With Medications Due to Illnesses by 9/11 Toxic Exposures to 9/11 dust and debris – Flickr Photo (Uploaded by NeverForget 911 and taken on September 23, 2007)

In the *Architects & Engineers for 9/11 Truth* Facebook group, the administrator shares a web link to the "World for 911 Truth" website on September 2, 2010. The post[174] on this website discusses the documentary film *Dust to Dust: The Health Effects of 9/11* and embeds this film that was uploaded to Google Video. In addition to the 46 people that "liked" this Facebook post, the following are snippets of comments that also appeared for this wall post:

> *"The vast majority of Americans still call these first responders, alive or dead, 'Conspiracy Nuts'....Their lives are worth nothing compared to keeping the Stock Exchange going...What of the families whose children were also exposed? The numbers are in the TENS of thousands. How many people were victims of 9/11???..." – Madeleine Lapointe-Millar*

[174] http://www.facebook.com/ae911truth/posts/115614488491686

> *"Interesting, I would have thought if the 'Official' 9/11 story were true & wtc 7, tower 1 & 2 miraculously collapsed in a never before seen 'pancake' collapse as opposed to an explosives aided implosion, most of the wtc debris wouldn't have been pulverized into such fine dust particles capable of harming so many of the first responders. But without the use of explosives how on earth did all 3 buildings collapse at freefall speed through the paths of maximum resistance, IT JUST DONT MAKE SENSE" – Max Bellers*

The snippet shown in the first comment raises the question whether the 9/11 death toll is now rising again due to the long-term health effects from the dust. The second comment reflects the link made between these health effects and the way in which the WTC buildings collapsed. Bellers suggests that if the buildings had not been pulverized into dust, then there might not have been a significant amount of dust compromising the air quality in Lower Manhattan.

As the ongoing crisis of the long-term health effects from 9/11 continues to unfold, it is unfortunate that the people who helped in the rescue and recovery efforts and the 9/11 survivors who live and work near ground zero are now 9/11 victims with an unknown fate. In the words of NYPD Detective James Zadroga, "Everyone praises the dead as heroes, as they should. But there are more *living* suffering than *dead*."

8.4 Scientific and Vetted Accounts of 9/11

This section provides examples of verified and vetted narratives. The first subsection presents vetted narratives from the *September 11 Digital Archive*. The second subsection discusses the verifiable narratives that appear in the *September 11 attacks* Wikipedia article and in the History Commons' *Complete 9/11 Timeline*. Last, this subsection presents examples of credible questioning from experts that are distributed in the social media landscape.

8.4.1 Official Documents in the 9/11 Digital Archive

In the *September 11 Digital Archive*, some of the artifacts are categorized as "Documents." Here I draw attention to two types of "documents" that were included in this archive. The first type is the *New York City Fire Department Incident Action Plans*[175] or FDNY Incident Action Plan (IAP), which are the daily reports used as a communication device among different groups to coordinate the rescue and recovery efforts at ground zero. The reports include "announcements of hazards, locations for void searches, updated safety rules, feeding sites, contact phone numbers of key personnel in charge at numerous agencies, and active construction plans and reports of work completed from the Department of Design and Construction." The archive proclaims that the purpose of sharing these documents is to make them "accessible and searchable to students, journalists, historians for fact-checking and scholarship." Each page in every IAP report includes the statement, "FDNY IAP – NOT FOR PUBLIC DISTRIBUTION." However, the description in the archive states that sharing these documents "is of utmost importance for researching the history and events of the WTC rescue and recovery operations."

The second type of document is labeled *Collected Reports*,[176] which is a collection of primary and secondary sources in PDF or HTML format. These reports, studies, and articles were produced by federal agencies and a variety of other organizations and institutions. The types of content that appear in these reports include "America's military response to September, air quality in lower Manhattan and its health effects, think tank reports on security issues, economic impacts, the war on terror, and civil liberties." The following is a sample of the official and vetted memoranda written by employees at the US Environmental Protection Agency (EPA) pertaining to the long-term health concerns at ground zero discussed in Section 8.3.2:

[175] http://911digitalarchive.org/galleries.php?collection_id=11
[176] http://911digitalarchive.org/galleries.php?collection_id=19 and http://old.911digitalarchive.org/collections/reports

> ***Memorandum 1:*** *Risk Assessment of Asbestos and other Toxic Substances from Cate Jenkins, EPA Hazardous Waste Identification Division, to Affected Parties and Responsible Officials on December 19, 2001. The subject of this memo includes (1) wipe sampling for asbestos in Lower Manhattan, (2) projection of airborne levels from settled WTC dusts, and (3) estimation of increased cancer risks based on various WTC dust exposure scenarios.*[177]
>
> ***Memorandum 2****: Preliminary Assessment of Asbestos Contamination of Lower Manhattan from Cate Jenkins, EPA Hazardous Waste Identification Division, to Affected Parties and Responsible Officials on January 11, 2002. The subject of this memo includes (1) asbestos in Manhattan compared to Libby Superfund site, (2) why cleanup of WTC contamination is ineffective to date, (3) advantages of cleanup under Superfund statute, and (4) summary risk assessment for WTC fallout.*[178]
>
> ***Memorandum 3****: National Ombudsman World Trade Center Hazardous Waste Case – Findings to Date, Recommendations to Date, and Second Round of Interrogatories from Robert J. Martin, National Ombudsman to Jane M. Kenny, the EPA Region II Administrator, on March 27, 2002. This report charges that the EPA had "abandoned its responsibilities for cleaning up buildings…that are contaminated or that are being re-contaminated, as a result of the uncontrolled chemical releases from the World Trade Center terrorist attack." While [the] Occupational Safety and Health Administration (OSHA) had concluded that all dust "must be presumed to be asbestos containing material" and must be cleaned up according to national standards, the report alleges that young children were still being exposed to airborne pollutants in homes and schools and that further efforts were needed to correct these conditions. The memo concludes with three recommendations and six interrogatories regarding EPA's actions to date.*[179]

In addition to making these memos publicly available, both Cate Jenkins and Robert J. Martin also appear in the *Dust to Dust: The Health Effects of 9/11* documentary film mentioned in Section 8.3.2, a film that is also available on YouTube and Google Video. Interviews from these reputable and trustworthy sources on this topic help to legitimate the claims and concerns that continue to be raised about the air quality in Manhattan after the WTC attacks.

Such documents from government agencies as well as media reports are valuable not only as historical records but as evidence for litigation purposes. However, the value of these documents is more visible when they are put in context. They currently exist as single records

[177] http://old.911digitalarchive.org/objects/105.pdf
[178] http://old.911digitalarchive.org/objects/104.pdf
[179] http://old.911digitalarchive.org/objects/113.pdf

similar to any other archive. Although this allows viewers to draw their own interpretations and conclusions without having any preconceived notions imposed by the archivists who aggregated these documents, this collection-based system still puts a burden on the viewer to try to make sense of each document's significance and understand the context in which they were created and shared. Therefore, it is worth considering how Wikipedia articles and the History Commons timelines provide such a context.

8.4.2 References in 9/11-Related Wikipedia Articles

As mentioned in Section 7.4.3 regarding the Bhopal gas leak, Wikipedia has become a pervasive resource for obtaining a general understanding of a particular topic or event. In some ways, Wikipedia editors resurrect or revive existing primary and secondary sources to explain the subject of interest. Editors reference these sources to justify their edits, and they also collectively weave together these sources by putting them in context and producing a neutral point of view (NPOV) narrative.

In this chapter, I mentioned a few Wikipedia articles related to the September 11th attacks. Within the main *September 11 attacks* article, each of the seven subheadings in this article (i.e., 1 Attacks, 2 Attackers and their background, 3 Aftermath, 4 Long-term effects, 5 Investigations, 6 Rebuilding, and 7 Memorials) contains a link to 26 other main Wikipedia articles specific to each of these 9/11-related topics. The main *September 11 attacks* article contains 278 references. The total number of references cited in the 27 main Wikipedia articles related to 9/11 is 2,031 with an average of 75 references. This is a considerable number of references that are used to legitimate these collaboratively produced articles. Although it is arduous to examine each of these references, most editors cite news articles, government documents, reports from emergency organizations, books, videos, and online websites.

For the *September 11 attacks* article, edits peaked in December 2005 with 3,178 edits and particularly in September 2006 with 5,658 edits out of the 15,182 edits to this date. I presume that many of these edits were a result of the increase in 9/11-related congressional briefings, in online activity by members of the 9/11 Truth movement, and in 9/11 conspiracy theories that occurred during this time period leading up to the fifth anniversary of the September 11th attacks. In an interview with the Wikipedia editor Mongo, who had the third highest number of edits (359 edits) to this article, he explained:

> *"Mostly all I have been doing is trying to keep the conspiracy theories out of the articles related to the 9/11 terrorist attacks....most of my edits have been to do that or revert vandalism to the articles. The articles related to 9/11 have less conspiracy theory misinformation than they used to have...but there are articles that discuss these notions elsewhere."*

Unlike other disaster events, the 9/11 attacks are infamous for the conspiracy theories that have brewed over the past five years. This has made the task of Wikipedia editors even more demanding, as they filter out what they believe to be "conspiracy theories" and try to maintain an article that is presented in a neutral point of view. Although some of these theories are implausible, the complex history of 9/11 as told by vetted and reputable sources reveals many discrepancies in the official 9/11 story not only evident in the Wikipedia article but also in the History Commons' *Complete 9/11 Timeline*.

8.4.3 History Commons Timelines

Unlike Wikipedia, History Commons (HC) attempts to provide a more comprehensive resource by presenting the topic in a larger temporal context based on a series of events over a long time period. The *Complete 9/11 Timeline* is their most extensive project and includes 6,412 events with 9,288 references, which is four-and-a-half times more references than all the 9/11-related Wikipedia articles combined. Additionally, adding an event to an HC timeline must go

through a three-step peer-review process "to ensure that it is well-written and well-sourced" and that it follows the HC style. This style includes the ability to categorize the event and cross-reference the event to other events in the timeline to show the links between events, similar to the interlinking of articles within Wikipedia.

Many of the references that appear in the HC's *Complete 9/11 Timeline* are similar to those found in the 9/11-related Wikipedia articles. The HC's timeline also had to filter out the 9/11 conspiracy theories. In fact, Paul Thompson, the originator of the this timeline, claims that this timeline "does not offer any theories at all [but] rather it simply lays out the facts so readers can come to their own conclusions." Moreover, Thompson asserts, "One of the strengths of this timeline is that it contains important nuggets of information that have been rescued from the obscurity of back page reporting and placed in their proper historical contexts." Many of the discrepancies in the 9/11 story appear in the mainstream media. Therefore, to maintain the credibility of the *Complete 9/11 Timeline* and prevent the misinterpretation that this timeline supports conspiracy theories and/or the 9/11 truth movement, Thompson explained:

> *"…we made a decision very early on to limit our sources to so-called 'mainstream' news organizations. Although there is great reporting in the alternative media, we don't want people to reject the important information in this timeline because of controversies about sourcing…While things may be changing, bloggers and such are still mostly limited to commenting and analyzing mainstream reporting. Sourcing is a constant challenge since there is so much political divisiveness and spin in the mainstream media…So ultimately, we try our best to sort through the misinformation, inaccuracies, and outright lies, but we are aware it is impossible to achieve 100 percent accuracy. It is up to the reader to note the sourcing and judge the veracity of the information for themselves. To that end, we strive to provide direct links to source articles so the reader can click on the link and judge the raw material if they desire to do so."*

The types of mainstream media that they consider are those from "television, cable, movies, books, government documents, and so forth" in the United States and Europe, while avoiding

"blatantly partisan publications where it is hard to tell where the hard reporting ends and the editorializing begins."

The power of the History Commons timelines lies in providing a comprehensive historical context based on vetted sources. This compilation of vetted sources presented in a timeline format has allowed different stakeholders to use the *Complete 9/11 Timeline*, in this case, as a vital resource for congressional testimonies. For example, Paul Thompson and the Jersey Girls (widows who lost their husbands in the 9/11 attacks) used this timeline at a congressional briefing on the 9/11 Commission's final report. Correspondent James Ridgway[180] of the Village Voice in New York City made the following comment about this timeline:

> *"[History Commons is composed] of a handful of freelance, unpaid, amateur sleuths who have become a 9/11 Information Central—what amounts to an intelligence apparatus aimed at pinning down what the Bush administration knew and didn't know about 9/11, before and after the attacks."*

Mike Tuck, an HC volunteer, further remarks, "What we want to do is make HC a more attractive place for these emerging 'Internet research sleuths' to contribute" while maintaining neutrality and accuracy in the timelines. One other comment about HC that Tuck[181] mentions is by Craig Unger, author of *House of Bush, House of Saud* and *The Fall of the House of Bush*:

> *"The material they provide is a welcome antidote to the misinformation and disinformation that has been coming out of Washington in recent years and they are essential tools in assembling a counternarrative that more honestly addresses the crises we face."*

As the *Complete 9/11 Timeline* attempts to be objective, what still remains is "a story full of espionage, deceit, and brazen lies," according to Paul Thompson. This has led many different types of experts to question the official 9/11 story.

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[180] http://www.villagevoice.com/2004-04-13/news/timeline-of-tragedy
[181] http://www.niemanwatchdog.org/index.cfm?fuseaction=showcase.view&showcaseid=0086&

8.4.4 Credible Questioning from Experts

The 9/11 Truth movement is most known for questioning the official 9/11 story. Although this movement has been plagued by unsubstantiated theories, there are also many independent, yet interconnected, 9/11 Truth organizations that promote empirically based claims. These include professional organizations such as *Scholars for 9/11 Truth and Justice*[182] and *Scientists for 9/11 Truth,*[183] as well as action-oriented organizations such as the *BuildingWhat?! Campaign*,[184] based in New York City but reaching nationwide, and the local Colorado 9/11 Visibility.[185]

Many of these organizations are organized around categories of stakeholders (e.g., widows, firefighters, political leaders, etc.), who apply their expertise to legitimate their reasons for questioning the official story. In an interview with one member from the *9/11 Truth Movement* Facebook group, he stated, "I was somewhat surprised to see a lot of professionals and academics publicly question the official story." This type of credible questioning is apparent on the info page of the *9/11 Truth Movement*[186] Facebook group, where it lists a series of 16 web links to 9/11 Truth organizations, such as the Patriots Question 9/11 as well as the Architects and Engineers, Pilots, Lawyers, Medical Professionals, and Marines for 9/11 Truth. Here I discuss the first two sites: Patriots Question 9/11 and Architects and Engineers for 9/11 Truth.

Patriots Question 9/11[187] is a website launched in September 2006 by Alan Miller as a result of finding material from the 9/11 Truth-related websites that challenged the 9/11 Commission Report. He decided to search for and compile public statements about 9/11 by senior U.S. military officers, law enforcement veterans, and government officials because he

[182] http://www.stj911.org
[183] http://www.scientistsfor911truth.org
[184] http://buildingwhat.org
[185] http://www.colorado911visibility.org
[186] http://www.facebook.com/group.php?gid=2204686781&v=info
[187] http://www.patriotsquestion911.com

believed that "their experience in intelligence gathering, espionage, terrorism, and covert military operations" was valuable and credible. The website includes public statements from the following types of experts that question the official 9/11 story:

- Over 1,400 architects and civil and structural engineers; mechanical, industrial, and mining engineers and material scientists; chemical and environmental engineers; aeronautical, aerospace and naval engineers; and electrical, computer, systems and software engineers
- Over 220 senior military officers; US government scientists and researchers; US law enforcement personnel; and US federal and state government officials
- Over 250 commercial and military pilots & aviation and aerospace professionals
- Over 400 professors in mathematics, science and engineering; philosophy, religion and theology; law and criminal justice; economics and finance; medicine and biological sciences; history, political science and government; anthropology, psychology, sociology, and social work; arts and humanities; education, leadership and management; evolutionary and environmental science, geology and geography
- Over 300 survivors including the WTC staff, occupants, and neighbors; fire, police, and emergency medical services; Pentagon survivors and eyewitnesses; and family members
- Over 200 artists, entertainers, and media professionals including stage, film and television performers; musicians; broadcasters and reporters; authors, writers, poets, and painters; and athletes and coaches
- Over 400 medical professionals

Miller acknowledges that "virtually none of the information on this website is the result of any original investigation on my part. I have merely researched and compiled public information available on the Internet." Still, this tremendous effort to compile these public statements is unprecedented. When people from different professions and background expertise collectively "question 9/11," it is worth considering how the awareness of this widespread questioning can collectively change the perception of an event and revise the evolving history of events like the September 11th attacks. The most prominent professional group that questions 9/11 is the architects and engineers.

Starting in 2006, the *Architects & Engineers for 9/11 Truth* (AE911Truth) formed using their expert knowledge to test the hypothesis of whether the World Trade Center buildings (i.e., the WTC Twin Towers and Building 7) collapsed due to explosive demolition. Architects and engineers applied their scientific knowledge, analyzed empirical evidence (e.g., video footage of the collapse, dust samples in and around ground zero containing iron-rich spheres and unexploded nano-thermite, eyewitness testimonies, etc.), and proved that the WTC Twin Towers and Building 7 exhibited all the characteristics of a classic controlled demolition with explosives but none of the characteristics of a natural collapse by office fires. Richard Gage, a 23-year architect who founded AE911Truth, presents proof that the explosive demolition hypothesis is true based on scientific, forensic evidence through the AE911Truth website[188] and their accounts on Facebook,[189] YouTube,[190] and Flickr.[191]

This particular 9/11 Truth organization justifies many of their assertions based on scientific, empirically based evidence and the application of their expert knowledge. Although many of the in-depth investigations into the structural collapses on 9/11 began a few years after the attacks, many of the architects and engineers in this movement used the forensic evidence collected by members of the public immediately after 9/11. The immense amount of video footage of the building collapses (i.e., WTC North Tower, South Tower, and Building 7) from different vantage points have become a vital form of forensic evidence to justify this 9/11 Truth organization's claims. The eyewitness reports broadcasted by mainstream news outlets also played a critical role in gathering real-time testimonies that would later be difficult to find or recollect if they had not been broadcasted on live television and archived locally by members of

[188] http://ae911truth.org
[189] http://www.facebook.com/ae911truth
[190] http://www.youtube.com/user/ae911truth
[191] http://www.flickr.com/photos/ae911truth

the public. What pervades the social media landscape are predominantly blog posts, Facebook groups and pages, YouTube videos, and Flickr photos that show how architects, engineers, chemists, and physicists scientifically disprove the official 9/11 story using empirical rather than conspiratorial evidence.

8.5 9/11-Related Direct Action

This last section presents narratives that exhibit the types of 9/11-related direct actions that have occurred. The first subsection explains the use of social media to facilitate the call for a new 9/11 investigation. The second subsection describes actions regarding the 9/11 health bill. The last subsection describes Muslim-related actions that have taken place since 9/11.

8.5.1 Call for a New 9/11 Investigation

In an interview with Akiva Steinmetz-Silber, who attended Stuyvesant high school (half a mile from the World Trade Center) at the time of the 9/11 attacks, he explains, "The World Trade Center towers were iconic and huge symbols of the American economy. This was an attack on America's ideology of capitalism. We only know partly what happened but not why did this happen and how did we get here?" Although Akiva is not personally interested in the politics surrounding 9/11, his questions reflect the natural urge to better understand the deeper cause of the 9/11 attacks. What has occurred over the past five years is an unprecedented use of social media (e.g., blogs, Facebook, YouTube, MeetUp, etc.) by 9/11 Truthers mobilizing around the demand for a thorough and impartial reinvestigation into the 9/11 attacks. This is one of the most pervasive direct actions that emerged after the attacks. The 9/11 Truth movement began in 2002 with family members who lost loved ones (e.g., the Jersey Girls) and gained momentum over the years particularly in 2005 with the launching of the 911blogger.com site and the internet

release of the film *Loose Change*. There are different questions and claims made within the 9/11 Truth movement that are not collectively agreed upon, but they all share a common principle.

At the heart of the 9/11 Truth movement is a demand for transparency by calling for a new investigation into 9/11 to address the many unanswered questions. The *9/11 Truth Movement*[192] Facebook group was created with the purpose of "asking the difficult questions and demanding answers about 9/11 and global politics." In the "recent news" section of this Facebook group, it provides a long list of links to "evidence" as the basis for their claims. This evidence is separated into the following 26 sections:

> *9/11 Timeline, 9/11 Commission, Bush Admin, NORAD and Cheney, Whistle Blowers, 9/11 Flights, Twin Towers, 9/11 Explosions and Squibs, WTC 7, Molten Metal, NIST – FEMA – Popular Mechanics, Nano Thermite, Flight 93, The Pentagon, Other Facts, Similar Events, Victims and Family Members, Fire Fighters and Police Officers, Media (MSM), Professionals for 9/11 Truth, Debunking 9/11 Theories, Osama bin Laden and al Qaeda, Zionism, History Links, 9/11 Documentaries, and Petitions – International Info.*

The plethora of links within each of these sections provides the viewer a sense of the overwhelming amount of "evidence" that would lead one to question the official 9/11 story. Although much of this evidence provides a holistic depiction of a valid alternative 9/11 story, other claims are not well substantiated and tend to paint the entire movement with the derogatory "conspiracy theory"[193] label.

For example, although Justin Martell founded *Students Scholars for 9/11 Truth*, he decided to leave the organization because of the conspiracy theories permeating the movement. Martell explains that the core of the 9/11 Truth movement is well intentioned, but some of the

[192] http://www.facebook.com/group.php?gid=2204686781&v=info

[193] The term "conspiracy theory" is a derogatory label in our culture that is used to discredit anyone who promotes a conspiracy theory other than an officially sanctioned account. Activists in the 9/11 Truth movement are quick to point out that, by definition, the official account of what happened on 9/11 is also a conspiracy theory. They point out, therefore, that we have two theories about what happened on 9/11: the official conspiracy theory and the alternative conspiracy theory.

"9/11 Truthers," including the leaders of this movement, have engaged in "intellectually dishonest behavior" by promoting theories rather than facts. He states:

> *"The real questions lie in the prior knowledge; the connections of the hijackers to various government agencies not only our own but to Pakistani intelligence and Isreali intelligence; serious questions about the hijackers proximity to our authorities while in this country; all the warnings we received; the war games taking place on the morning of 9/11; the fact that every single time the FBI/CIA was on the case of hijackers they were always thwarted in some ways by their superiors; the Bush administration's deliberate obstruction of justice; the failure of the 9/11 commission to answer 70% of the questions brought by the victims' family members; the refusal of Bush and Cheney to testify at the 9/11 Commission; and questions about NORAD's response on that morning. These are the things that have legs, not that there was no plane that hit the Pentagon."*

These issues are relevant in researchers' attempts to unveil the complex truth of why 9/11 happened. Much of how Martell was able to legitimize his reason for demanding a new 9/11 investigation was by citing vetted sources that showed evidence of these activities.

Other 9/11 Truth organizations also try to use empirical evidence as a way to legitimate their call for a new investigation. As mentioned in the previous section regarding *Architects & Engineers for 9/11 Truth*, approximately 1,450 verified architectural and engineering professionals and approximately 11,300 other supporters have signed a petition demanding an independent investigation. The petition reads as follows:

> *"On Behalf of the People of the United States of America, the undersigned Architects & Engineers for 9/11 Truth and affiliates hereby petition for, and demand, a truly independent investigation with subpoena power in order to uncover the full truth surrounding the events of 9/11/01 – specifically the collapse of the World Trade Center Towers and Building 7. We believe there is sufficient doubt about the official story to justify re-opening the 9/11 investigation. The new investigation must include a full inquiry into the possible use of explosives that might have been the actual cause of the destruction of the World Trade Center Twin Towers and Building 7."*

Since architects and engineers have expertise in the structural design of buildings and the physics behind the deconstruction of buildings, their petition includes a statement that is specific to this

issue. Similarly, the many other 9/11 Truth organizations have tailored their online petitions to specify their unique motivation for urging others to demand a new 9/11 investigation based on issues related to their profession.

For example, the *Firefighters for 9/11 Truth*[194] organization demands an investigation that follows national standards. Eric Lawyer,[195] a firefighter who founded this organization, stated:

> *"9/11 was the greatest loss of life and property damage in U.S. fire history. This should have been the most protected, preserved, over tested, and thorough investigation of a crime scene in world history. Sadly it was not…We know from their own admission that the majority of the evidence was destroyed."*

Their petition includes the following statements:

> *"NFPA (National Fire Protection Association) 921, which is the National Standard for Fire and Explosion Investigations, very clearly indicates in numerous sections that the possibility of explosives should have been thoroughly investigated…We, the undersigned, demand the following:..2) The investigation to follow the National Standards so clearly outlined in the National Fire Protection Association guidelines, specifically, NFPA 921 to include thorough analysis of the steel for the presence of 'exotic accelerants.' 3) Congress to honor the promises made to the rescue workers of 9/11 by passing the James Zadroga 9/11 Health and Compensation Act of 2008."*

In the case of this 9/11 Truth organization, they explain the importance of following the standards and requirements asserted by the NFPA. They also draw from their past experiences dealing with structural fires as a way to connect this with the scientific findings by architects and engineers, as previously mentioned. Last, their petition includes the demand to pass the Zadroga 9/11 Health and Compensation Act, which will be discussed in the next subsection.

Tailored statements are included in petitions created by other 9/11 Truth organizations. For example, the following appears in the *U.S. Military Officers for 9/11 Truth*[196] petition:

[194] http://firefightersfor911truth.org
[195] http://www.youtube.com/watch?v=kxGB2YoGV-I
[196] http://www.militaryofficersfor911truth.org

"As a result of U.S. military action based on the official account of 9/11, thousands of U.S. servicemen and women and hundreds of thousands of civilians have lost their lives…"

The following appears in the *Medical Professionals for 9/11 Truth*[197] petition:

"…As medical professionals, we are trained in science and logical reasoning. …Life-threatening maladies caused by toxic environmental conditions at Ground Zero in New York City persist today and will continue to develop in the future…"

The following appears in the *Lawyers for 9/11 Truth*[198] petition:

"…As attorneys, we have expertise in analyzing competing claims, weighing conflicting evidence, and reaching logical decisions about what really happened…many high-powered attorneys have questioned the Bush administration's explanation for 9/11 itself, including why the Bush administration allowed the hijacked planes to inflict so much damage on 9/11…"

The following appears in the *Religious Leaders for 9/11 Truth*[199] petition:

"WHEREAS religious leaders seek to promote various universal values, including love, justice, and truth; and WHEREAS religious leaders throughout history have spoken out on moral issues; and…WHEREAS the official account of 9/11 has been used to indict Islam as an inherently violent religion and to justify discrimination against Muslims and attacks on Muslim countries…"

Last, the following appears in the *Actors and Artists for 9/11 Truth*[200] petition:

"…We have also formed this organization because of the special ability of actors and artists to cast light on issues that would otherwise remain in the shadows. This ability has been demonstrated in relation to 9/11 by a few members of our professions, who, when they publicly raised questions about 9/11, received considerable press coverage…WHEREAS we as actors and artists have an important role in guarding against false interpretations of events used as pretexts to restrict civil liberties…"

For some of these 9/11 Truth organizations, they are able to draw attention to concerns about the official 9/11 story by producing specialized petitions using social media services like Facebook. For example, the *9/11 Truth Movement* has over 49,000 members. The *Architects & Engineers*

[197] http://mp911truth.org
[198] http://lawyersfor911truth.blogspot.com
[199] http://rl911truth.org
[200] http://actorsandartistsfor911truth.com

for 9/11 Truth[201] Facebook page has over 31,800 people that "like" this page. The *Firefighters for 9-11 Truth*[202] Facebook page has over 7,100 people that "like" this page. Last, the *World for 9/11 Truth*[203] Facebook page has over 29,600 people that "like" this page. Administrators and other Facebook members create wall posts that link to these petitions that demand a new investigation into 9/11.

There are many issues that people in these movements believe would be addressed if a new and open investigation into 9/11 were conducted. Frances Shure, who helps lead the *Colorado 9/11 Visibility*[204] multipartisan group, states in an email interview:

> *"The issues that we believe would be automatically addressed by a real investigation would be as follows:*
>
> *(a) The legitimacy of the wars in Afghanistan and Iraq would be addressed, along with the demonization of Muslims, and all of the other violence for which 9/11 was the pretext.*
>
> *(b) The decimation of civil rights would automatically be addressed if a real investigation were to be undertaken revealing the evidence trail that strongly leads to intelligence agencies (within and without the U.S.), the White House, corporations, members of the legislature, etc.*
>
> *(c) In addition to the above specific issues, I think that people would ask, "How did we get here—to this level of corruption?" This questioning, therefore, would lead to certain root issues that would hopefully lead to other investigations and a restructuring of our system to help protect us from this level of corruption and violence in the future."*

Colorado 9/11 Visibility attempts to provide the historical context in which to understand 9/11 while also demanding a new investigation that would help prevent such events from happening in the future.

One other grassroots movement that has emerged is *We Are Change*,[205] a "peace and social justice movement working to reveal the truth behind the events of September 11th, as well

[201] http://www.facebook.com/ae911truth
[202] http://www.facebook.com/pages/Firefighters-For-9-11-Truth/275102959055
[203] http://www.facebook.com/world911truth?v=info
[204] http://colorado911visibility.org

as the lies of government and corporate elite who remain suspect in this crime." This movement or "idea," as they say, exists through their Facebook page, YouTube account, MeetUp group, and the subsequent social media accounts created by local chapters around the world. One of the ways in which people from *We Are Change* as well as the *9/11 Truth Movement* communicate the need for a new 9/11 investigation is by asking elected officials whether they support a new investigation. For example, a YouTube video titled *WeAreChange: New York Senator Gillibrand Supports New 9/11 Investigation*[206] was uploaded on May 30, 2009, and recorded Manny Badillo, nephew of Thomas Joseph Sgroi who died as a result of the 9/11 attacks, interviewing New York's junior Senator Kirsten Gillibrand. The following is a snippet of the interview:

> ***Manny Badillo****:…I'm asking you how you feel given the fact that family members, first responders, scientists, and even your colleagues feel that there should be a new and open investigation into what happened in New York City on 9/11. Do you support a new investigation to what happened?*
>
> ***Senator Gillibrand****: Based on what you just told me and that 70% of the families' questions weren't answered, I think those questions should be answered. So if that means another review or a fuller hearing or more opportunities of the families, I will support that. Because I do think that it is important that every family member has every question answered.*
>
> ***Manny Badillo****: …We have a petition that is taking place right in New York City to get on the November ballot the ability for New York City voters to decide whether or not to have that 9/11 investigation with subpoena power privately funded. Do you support the efforts of over 40,000 so far New York residents in having the question of whether or not to have a 9/11 investigation in New York City on the November ballot?*
>
> ***Senator Gillibrand****: I would very much like to look at that issue because that sounds like something that the voters should be a part of the discussion.*
>
> ***Manny Badillo****: Let's hold our senators and our elected officials accountable. Senator Gillibrand just gave tremendous support to the 9/11 victims family members and the 9/11 first responders. Call her office. Support what she just said. Support what the family members and first responders are looking for. We are looking for truth and justice to the mass murder that took place. Senator Gillibrand, thank you very much for your honesty and integrity. I'm doing this for you, Uncle Tom. I love you. WeAreChange.org.*

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[205] http://www.wearechange.org
[206] http://www.youtube.com/watch?v=msGxrHISayI

This is one of many examples of people from these movements obtaining video recordings of elected officials agreeing that they would support a new investigation into 9/11. The struggle to call for a new investigation still continues, particularly following a court's rejection of the petition mentioned by Badillo that would have required New York's city council to place the creation of a 9/11 investigating commission on the 2009 November ballot. One other issue that was raised in this interview was how Senator Gillibrand has been working to help pass the 9/11 health bill on the House of Representatives side. The next subsection discusses how she helped to enact this bill in tandem with the social media activity around this 9/11-related ordinance.

8.5.2 9/11 Health Bill: The Zadroga Act

Long-term health effects associated with those exposed to the toxins from the collapse of the World Trade Center buildings, as discussed in Section 8.3.2, have led to direct actions demanding the need for healthcare support. Those who were most affected by the toxins from the dust that blanketed Manhattan were the responders at ground zero who engaged in rescue, cleanup, and rebuilding efforts as well as New Yorkers living and working near ground zero.

On August 14, 2006, former Governor of New York George Pataki signed legislation that would have provided free health monitoring and financial aid to 9/11 workers sick from illnesses due to their exposure to toxins at ground zero. Senator Bob Menendez and Congresswoman Carolyn Maloney sponsored this legislation. It became known as the James Zadroga 9/11 Health and Compensation Act in honor of NYPD Officer James Zadroga, who died in early 2006 from being exposed to the toxins at ground zero. This bill was not passed in 2006, but in September 2010 Senators Kirsten Gillibrand and Chuck Schumer helped to create a new version of this act that finally passed the US House of Representatives. However, on December 9, 2010, the Democrats were not able to break a Republican filibuster against the bill in the

Senate. On December 16, 2010, comedian Jon Stewart of *The Daily Show* brought four 9/11 responders to his show to discuss their reaction to the Senate filibuster in an attempt to raise awareness about the Zadroga Act. On December 22, 2010, senators Gillibrand and Schumer announced that they had reached a deal with Republican senators (namely, Senators Tom Coburn and Mike Enzi) on the bill. The Zadroga Bill received final congressional approval and was enacted by President Obama on January 2, 2011.

Much of the activity that occurred in the social media landscape tended to be in support of the 9/11 health bill. Here, I discuss a subset of the social media activities that took place in Facebook, Twitter, and YouTube pertaining to this health bill.

In Facebook, there are approximately 40 Facebook groups, pages, and causes in total. The following are some of the names of these Facebook artifacts: I Support the James Zadroga 9/11 Health and Compensation Act of 2010, Pass H.R. 847 and Get 9/11 First Responders the Health Care They Deserve, Support the Zadroga 9/11 First Responders Health Bill, 9/11 Workers and Rescuers should have free healthcare for life!, and SUPPORT THE 9/11 RESCUE WORKERS BECAUSE THE GOVERNMENT SURE AS HELL IS NOT.

In the *I Support the James Zadroga 9/11 Health and Compensation Act of 2010*[207] Facebook cause, over 5,400 people "liked" this cause at the time of writing this. In the description, it states,"42 US Senators have decided to play politics with the lives of 9/11 responders. Please, join this cause and show these Senators they are wrong. Did they already forget?" In this Facebook cause, Facebook users shared their reactions to the politics surrounding the passing of this bill as well as how this bill is personally meaningful to them. For example, Michael Roberts posted:

[207] http://www.causes.com/causes/555941-i-support-the-james-zadroga-9-11-health-and-compensation-act-of-2010

> *"As A injured Paramedic because of 9/11 People should be made aware that there are firefighters, Police Officers and EMS personnel that went to New York City to help at Ground Zero that are now in danger of getting sick because of the toxins at Ground Zero. A 100 responder from Nevada went to Ground Zero to help so this is not just a New York concern."*

Roberts not only shares how this bill affects his own life but also emphasizes that this bill and the support around this bill should not be limited to the responders from New York. Joey Angel responds to Roberts's wall post with the following snippet of his reply:

> *"@ Michael Roberts - You are 100% correct. For the past 9 years I have researched and studied testimony, reports from the City of NY, Political views and research test results, that all point to a festered upcoming decline in health for persons who have not registered being unaware of the serious nature involved. I have spoken to hundreds of FIRST RESPONDERS of 9/11 WTC and which also includes recent war Veteran's as well as Desert Storm Veteran's. All in kind to your cry for help, I find it amazingly profound how all of us have been misdiagnosed and that the Desert Storm sick First Responders have the same serious sensitive chronic skin rash and allergic reaction as me as well as other medical conditions. I was informed that many of those service forces have died unexplained. There is more to all of this than the powers that be want us to know."*

Angel attempts to draw attention to the complexities of the politics surrounding who is considered a 9/11 responder affected by the toxins at ground zero, which is critical for receiving compensation from the federal government. In another wall post, Arthur Rochester writes:

> *"Lobbyists from the 'US' Chamber of Commerce are opposed to this legislation as long it is funded by closing a special loophole that protects FOREIGN corporations that make money in the United States from paying their fair share of taxes."*

Rochester emphasizes the irony that passing the 9/11 health bill would result in a win-win situation of benefiting both the 9/11 responders and helping to close a corporate tax loophole. This issue is also raised in a Facebook group.

In the Pass H.R. 847 and Get 9/11 First Responders the Health Care They Deserve[208] Facebook group, the "info" page states:

> *"The majority of Republicans voted against it, presumably because it included a provision intended to pay for the bill which would have closed the tax loophole that allows multinational corporations to utilize tax havens and avoid paying their fair share of taxes."*

The administrator, Chris Middleton, also wrote the following wall post on November 19, 2010:

> *"Doing the math it's easy to see that $625 mil distributed to around 10,000 people only pays out to about $62,500 per person (if it's distributed equally), which is hardly enough to cope with yearly medical bills and now almost a decade of health problems, and furthermore, it doesn't account for first responders who haven't filed suit. However, it's certainly a step in the right direction."*

Middleton attempts to draw attention to the concessions made regarding this bill by juxtaposing the progress of the bill with the roadblocks that this bill has faced.

During the ninth anniversary of the 9/11 attacks, one of the primary conversations that emerged in Twitter was on the 9/11 health bill. The word "health" was used 766 times and the word "healthcare" was used 518 times in the 9/11 twitter dataset collected. Here, I provide a sample of some of the tweets related to this issue. The following tweet is an example of how a member of the public uses Twitter as a public letter to the Senate petitioning to pass the bill:

> *"Dear Senate, pass the James Zadroga 9/11 Health and Compensation Act of 2010. We can spare $7 bil for the first responders. We really can." @dtlawson*

The following tweet is an example of how people singled out those who voted against the bill in the House in an attempt to urge people to call their representatives to pass it in the Senate:

> *"John Boehner (R-OH) Voted Against Healthcare for 9/11 Rescue Workers http://nyti.ms/d023N1 Rt #OH08 #p2 #tcot #topprog #FF" @TheNewDeal*

[208] http://www.facebook.com/group.php?gid=143291502365719&v=wall

Last, the following tweet is by Senator Gillibrand herself who tweeted about how she is making efforts to pass the bill in the House and in the Senate:

> *"I held an event on #LongIsland to discuss our efforts to pass the 9/11 health bill. House has passed it, now the Senate must act." @SenGillibrand*

Although many of the tweets on this issue tend to just be links to news articles on the developments of this bill, we are beginning to see how the general public as well as elected officials and other prominent figures are using their voice to promote certain legislations.

For example, the most viewed YouTube video regarding the 9/11 health bill is titled *Anthony Weiner Rips Apart Republicans on 9/11Health Bill*.[209] It was uploaded by NewYorkLiberal on July 29, 2010, and has received over 942,000 views and over 10,000 comments on YouTube. This C-SPAN clip shows Congressman Weiner yelling at Republicans regarding their vote against the 9/11 health bill. This video of a congressman passionately sharing his view on this legislation resulted in a tremendous amount of social media attention not only in watching his reaction but also in commenting on his reaction.

As mentioned in the beginning of this subsection, Jon Stewart's last 2010 *Daily Show*, aired on December 16, 2010, focused primarily on the Zadroga bill (aka 9/11 health bill). The exclusive clip from this show titled "Worst Responders"[210] received over 320,000 views; he drew attention to the lack of coverage by America's mainstream news networks and juxtaposes this with Al Jazeera's 22-minute coverage on the Zadroga bill. Another exclusive clip from this show titled "9/11 First Responders React to the Senate Filibuster"[211] received over 604,000 views, where he invited four 9/11 responders to share their thoughts on the politics around the Zadroga bill in the Senate juxtaposed with Mitch McConnell's emotional speech regarding Jon Kyl's

[209] http://www.youtube.com/watch?v=W4zwCMf8dsc
[210] http://www.thedailyshow.com/watch/thu-december-16-2010/worst-responders
[211] http://www.thedailyshow.com/watch/thu-december-16-2010/9-11-first-responders-react-to-the-senate-filibuster

retirement and the Senate's urge to not work between Christmas and New Year's. The following tweets were sent by @TheDailyShow on December 17, 2010:

> *"9/11 first responders share what they think of Senate Republicans filibustering the Zadroga bill. http://bit.ly/e7BnAz #DailyShow" RT by 100+ people*
>
> *"Jon talks to 9/11 first responders and asks Mike Huckabee about the objective part of Fox News. http://bit.ly/gDPfaL #DailyShow" RT by 52 people*
>
> *"Mike Huckabee believes every Republican should vote for the Zadroga bill because it is owed to them. http://bit.ly/htYaJd #DailyShow" RT by 20 people*
>
> *"America's news networks are scooped with a sympathetic Zadroga bill story from Al Jazeera. http://bit.ly/goEtVE #DailyShow" Retweeted (RT) by 39 people*

Stewart's juxtapositions related to this 9/11 health bill are an attempt to raise the level of discussion on this issue and question the priorities in the federal government regarding 9/11.

Stewart's show led to reactions from a wide spectrum of people. White House press secretary Robert Gibbs[212] stated in a White House press briefing on December 21, 2010:

> *"If there's the ability for that to sort of break through in our political environment, I think there's a good chance that he can help do that. I think he has put the awareness around this legislation. He's put that awareness into what you guys cover each day, and I think that's good. I hope he can convince two republicans to support taking care of those that took care of so many on that awful day in our history."*

Gibbs's comment was written in online news articles, which were then shared through social media posts. When the Senate passed the bill on December 22, 2010, New York Mayor Michael Bloomberg sent the following tweet[213]:

> *"Big thanks to @SenGillibrand, Sen Schumer and Jon Stewart @TheDailyShow for work to pass the Zadroga Act http://bit.ly/fDe8Ts" RT by 100+ people*

As high-profile government officials praised comedian Jon Stewart and the many elected officials and 9/11 responders for their efforts in passing the Zadroga bill, others in the social

[212] http://www.youtube.com/watch?v=6kxn9Qtl6Oc&
[213] http://twitter.com/MikeBloomberg/statuses/17702945021755394#

media landscape echoed their reactions to Jon Stewart's *Daily Show*. The following wall posts appeared in a Facebook group and Facebook cause related to this 9/11 health bill:

> *"We have The Daily Show to thank. Jon Stewart ripped those who blocked it a new one. He shamed those who blocked it into action. Politicians didn't do this because it was the right thing to do. They did it because they were called out in a very public way." – Versatile Green*
>
> *"its a damn shame that the role of news anchorman has fallen to a comedian. http://www.thedailyshow.com/watch/thu-december-16-2010/9-11-first-responders-react-to-the-senate-fil" – Dennis Captain Jing Jing*
>
> *"Please write your State Senators and tell them to get back to work. NO FIREFIGHTER ANYWHERE EVER FELT IT WAS NOT AN HONOR TO BE ON DUTY ON CHRISTMAS!" – Larry Metsch*

The fourth most viewed YouTube video related to the 9/11 health bill is titled *Jon Stewart Changes Fox News 9/11 Responders Bill Opinion*[214] and was uploaded by TheYoungTurks on December 20, 2010. This YouTube video have received over 111,000 views and over 1,400 comments to this date. The host of TheYoungTurks Network, Cenk Uygur, explains how Jon Stewart changed the Fox News coverage on the bill because of Stewart's show and Stewart personally asking Mike Huckabee (who hosts the weekend show *Huckabee* on Fox News) to ask Fox News to discuss the bill on their own network. Some comments to this YouTube video are:

> *"This pleases me. As Jon Stewart said last week, if anyone is poised to push for the passage of this bill, its Fox News, the network that's not only in bed with the Republican Party (financially as well as ideologically) but has also made a habit of keeping the issue of the Sept. 11, 2001 attacks front and center over the last decade. Is it possible that FOX could actually use its powers for good instead of evil? That truly would be a christmas miracle." – ultrapirtle*
>
> *"The thing is, this bill is overdue, what happened years ago, when these guys spoke out about how they had developed health problems, and they went into Ground Zero, because the EPA said it was safe, when it wasn't, that was almost 3 years ago, if anyone had watched 'The 9/11 Chronicles: Part 1, Truth Rising' people who have known this, but no, since it's made by Alex Jones, it's gonna be some nut piece, well, on the contrary, the piece is from the first responders perspectives themselves." – CJCA915*

[214] http://www.youtube.com/watch?v=Knqpgj0x7xY

Although Jon Stewart's efforts to raise awareness of the Zadroga bill was instrumental in getting it passed, the amount and type of commentary that pervaded the social media landscape in response to Stewart's show was also critical to passing the bill.

8.5.3 Muslim-Related Actions

One final set of 9/11-related direct actions being discussed in the social media landscape is the recent events involving Muslim-related issues. Anti-Muslim attacks emerged in response to national attention regarding the building of the proposed Park51 or Cordoba House (aka Ground Zero Mosque) in May 2010 by the Muslim cleric Imam Feisal Abdul Rauf as well as the call to burn a copy of the Quran by Florida pastor Terry Jones on September 11, 2010, the ninth anniversary of the attacks.

Facebook activity is considerably high on these two issues. There are over 130 Facebook groups and over 350 Facebook pages that are related to the Ground Zero Mosque, but this issue is much more contentious with Facebook artifacts both for and against the building of the mosque. There are over 400 Facebook groups that are predominantly, if not entirely, against the burning of the Quran. Around 150 Facebook pages are also all against the burning of the Quran. For example, the *People Of Faith Opposed To The Burning of the Qur'an*[215] Facebook page led to over 22,500 people "liking" this page.

Both of these issues emerged more frequently in Twitter during the ninth anniversary of the 9/11 attacks than any other topical issue related to 9/11. The following are some of the word frequencies related to these issues in the 9/11 Twitter dataset collected during the ninth anniversary:

[215] http://www.facebook.com/pages/People-Of-Faith-Opposed-To-The-Burning-of-the-Quran/145050015533692

- "Burning" appeared 5,397 times
- "Koran" appeared 4,141 times
- "Quran" appeared 3,863 times
- "Mosque" appeared 2,661 times
- "Pastor" appeared 2,119 times
- "Jones" appeared 1,224 times
- "Imam" appeared 887 times

The following are some examples of tweets that discuss these issues:

> *"That mosque really shouldn't be built so close to ground zero .. its just disrespectful :\ 9/11 RIP <3" – @_Sophieeee_*
>
> *"Im NOT willing to accept muslims in AMERICA. I havnt forgotten what they did on 9/11 in NY. I DISSAPPROVE of the mosque goin in by ground 0." – @65GTOFAN*
>
> *"I say they build the mosque there. So what? Christians and Catholics, MUSLIMS were killed on 9/11 as WELL, idiots." – @HarrietThugman*
>
> *"The US pastor's plan of burning the Quran on 9/11 is against public interest as well as the teachings of Christianity." – @hpmishra*
>
> *"Pastor's provocative threat to burn Quran on 9/11 is indicative of wave of Islamophobia fuelled by neocons n their zionist allies in USA!" – @ijassat*

Some of the tweets also referred to marches and demonstrations that took place in response to these controversies. In Flickr, Viktor Nagornyy[216] took a series of photos of the rallies that took place on the ninth anniversary of the September 11th attacks. Figure 59, titled *NYC Pro-Muslim Rally Marching On Sept. 11th, 2010*, captures the Emergency Mobilization Against Racism and Anti-Muslim Bigotry rally that culminated with a march around New York's City Hall. According to Nagornyy, "thousands of people, from all walks of life, came to the rally to show their support." As tensions continue to rise between pro-Muslim and anti-Muslim groups, others have begun to reflect on the broader shift happening with the "war on terrorism" in relation to the recent 2010 and 2011 protests in the Middle East (e.g., Egypt, Tunisia, Libya, etc.).

[216] http://www.flickr.com/photos/viktor-nagornyy/4986984231

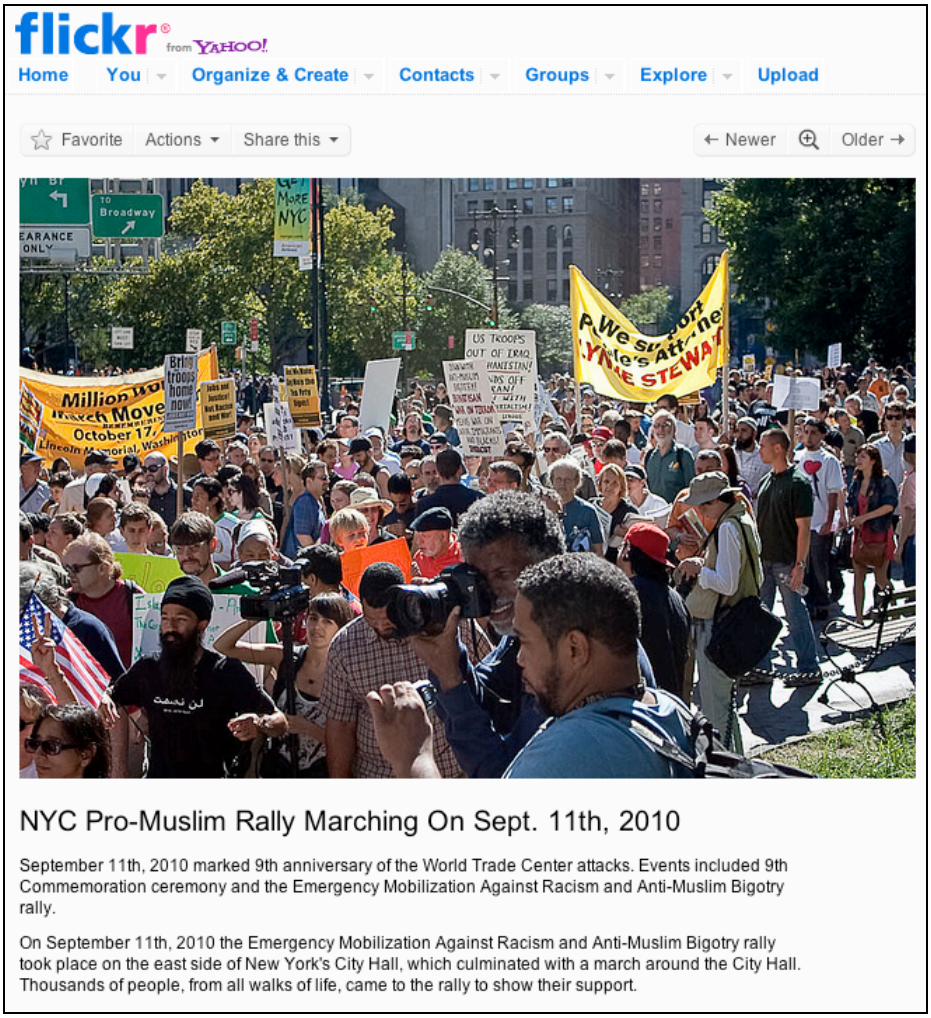

Figure 59: NYC Pro-Muslim Rally Marching On Sept. 11th, 2010 – Flickr Photo (Uploaded by Viktor Nagornyy on September 11, 2010)

On February 23, 2011, Andy Worthington, a freelance investigative journalist, author, and filmmaker who specializes in the "war on terror," wrote a blog post[217] entitled *The Year of Revolution: The "War on Tyranny" Replaces the "War on Terror."* He describes the first decade of the 21st century as a period when people became fixated on terrorism, which led to "an ill-defined war" in Afghanistan, an "entirely illegal war followed in Iraq," and a "complete demonization of Islamists—and of Islam." He further remarks:

[217] http://www.andyworthington.co.uk/2011/02/23/the-year-of-revolution-the-war-on-tyranny-replaces-the-war-on-terror

> *"This has been a disaster for relations between Christians and Muslims worldwide, leading to widespread Islamophobia in Western countries and a rewriting of history, in which liberation struggles in Bosnia and Chechnya, for example, have been recast as terrorism, and any opposition to the dictators of the Middle East has also been regarded as terrorism—even when, as with Libya, for example, opponents of Gaddafi's regime used to be considered as victims of oppression until Gaddafi strategically decided to become an ally in the 'War on Terror.'...Suddenly, however, the landscape has changed again, as popular uprisings across the Middle East fundamentally challenge the assumptions of the 'War on Terror'—that dictators are needed more than ever to restrain the fundamentalists who, otherwise, would be establishing their own barbarous regimes and, of course, threatening Western interests."*

The link made between the revolutionary movements in the Middle East to the Islamist threat in the form of terrorism is, in some ways, Worthington's attempt to revise the "war on terror" narrative by creating a new phrase, the "war against tyranny." His retrospective analysis sheds light on the ramifications of the "war on terror" narrative, which is then juxtaposed with a prospective outlook on what these ramifications mean in the context of current events taking place in the Middle East.

8.6 The Living Heritage of the 9/11 Attacks in Social Media

The 2001 September 11th attacks were undoubtedly a historically significant event. Those who now use "9/11" do so as a shorthand expression to reflect how this crisis has become part of popular understanding. Although some have moved on, others continue to commemorate this crisis in new ways through social media. The findings presented in this chapter are examples of how people are generating social media artifacts on a daily basis to keep the 9/11-related memories alive long after this crisis event took place. This persistent act of commemoration in the social media landscape is evident in the daily Google Alerts on the terms "September 11 attacks" and "9/11 attacks," the daily email from the *9/11 List-Serv* Google Group, and the plethora of recent content within each of the popular social media services.

The amount of social media content pertaining to the 9/11 attacks is immense and still growing even almost 10 years after the attacks. Although the amount of media produced just during the emergency period of 9/11 in 2001 alone was unprecedented, the findings here also illustrate the enormity of 9/11-related social media artifacts created well after the attacks. These artifacts unveil the complex history that led up to the 9/11 attacks as well as the social, cultural, and political consequences that have emerged in the post-9/11 world.

The challenge I faced was choosing a few out of the hundreds of 9/11-related social media artifacts that I analyzed to present in this chapter in order to provide illustrative examples for each of the five 9/11 meta-narratives outlined here. Other descriptive examples could have been presented within each of the meta-narratives (e.g., the loss of civil liberties or the economic effects of 9/11 as other types of ongoing narratives). However, my intention here is to expose merely a portion of the digital heritage of the 9/11 attacks in the social media landscape through five meta-narratives.

These meta-narratives are broad enough to represent a significant portion of the heritage pertaining to 9/11 while also being pertinent in a way that illustrates the processual nature and living existence of 9/11 sustained in part by social media. In contrast to the digital heritage of the Bhopal gas leak discussed in the previous chapter, the digital heritage of 9/11 exhibited a much larger amount of content within each of the five meta-narratives, and these narratives were generally much richer in quality. Although the 1984 Bhopal gas leak and the 2001 September 11th attacks are different in type of hazard, location of crisis, and the age in which they each took place, it is worth comparing and contrasting the quantity and quality of meta-narratives I found between these two crises.

The 9/11 narratives related to the cause of the attacks (e.g., preceding conditions, narratives about the cause of the crisis, agent) narratives were much more in-depth than those pertaining to the Bhopal disaster. The 9/11 narratives consisted of exhaustive timelines and striking juxtapositions between the official 9/11 story against evidence challenging this story. The scope of 9/11 in terms of the cause of this crisis is so vast that the *September 11 attacks* Wikipedia article only provides a glimpse into the complex and controversial history of 9/11. Instead, the History Commons *Complete 9/11 Timeline* provides a more comprehensive documentation of the causes and effects of 9/11. The *Bhopal disaster* Wikipedia article is fairly in-depth and provides enough details and resources to communicate the many warning signs that led to the Bhopal disaster. The 9/11 attacks and the Bhopal disaster are both man-made, human-induced hazards that could have been prevented or controlled to some degree. The 9/11 attacks were, in some ways, a crime against humanity, while the Bhopal gas leak was anthropogenic as a result of technological failure. Therefore, the narratives related the causes of these two crises present the historically produced patterns of vulnerability that led up to these events. **I would argue that the motivation for generating and sharing these narratives in the social media landscape is to promote disaster preparedness and mitigation to strengthen our society's resilience to future crises that are of a similar type**. This is one of the critical aspects of sustaining the living heritage of historic crises like 9/11 and the Bhopal disaster: learning about the causes that led to these crises. The findings here show a promising trend toward legacy narratives.

The 9/11 survivor narratives were quite different from the Bhopal survivor narratives, which may largely be due to the differences in eyewitness reporting practices at the time of these events. Although there are similar written accounts from survivors being shared in social media

services like Facebook groups for both crises, there was an unprecedented amount of visual footage on the 9/11 attacks from different sources and stakeholders, since personal recording devices were more ubiquitous at the time of the attacks. Professional photographers and photojournalists took most of the photos and videos pertaining to Bhopal survivors, which were shared more frequently in social media. Amateur photos and videos that document Bhopal survivors were typically taken in the context of recent direct actions. In the case of 9/11, a plethora of eyewitness narratives pervade the social media landscape. Many of the 9/11 digital archives presented in this chapter predominately contain stories from survivors and eyewitnesses in addition to those sharing stories about how they first heard about the 9/11 attacks. The impetus to record and share these stories immediately after 9/11 was more pronounced than previous disasters. An unexpected practice that emerged in the aftermath of 9/11 was the use of these raw photos and videos of the 9/11 attacks crisis as empirical evidence for those challenging the official 9/11 story. In contrast, the value of the Bhopal survivor stories that have surfaced in the social media landscape are those that commemorate the unsung heroes and that communicate the protective actions that could have been taken during the gas leak. Therefore, the Bhopal survivor stories were more practical and informative, while the 9/11 survivor stories were used for substantiation purposes.

The narratives about the ongoing effects of the Bhopal and 9/11 disasters were both high in quantity and quality. However, those pertaining to 9/11 will always surpass Bhopal in quantity because the immediate effects of 9/11 are still felt daily on an international scale. Unlike other terrorist attacks, 9/11 became the pretext for launching two wars and restructuring the US federal government with regard to security issues, both of which have dominated the discourse in mainstream media and social media. In the case of the Bhopal disaster, the “No More Bhopals”

slogan became a way to promote disaster mitigation by reminding people of the likelihood of similar technological hazards due to the lack of safety measures being implemented at chemical plants around the world. The narratives discussing the lack of corporate and government responsibility that resulted from the Bhopal disaster are now being kept alive by mentioning them in the context of current crises involving similar forms of negligence. Yet, both the WTC attacks and the Bhopal disaster caused long-term health effects resulting in an ongoing readjustment of not only the casualty counts but also the scope of these crises. These narratives are now constant reminders of the processual nature of these crises, which have unclear endings. Unlike the previous two types of meta-narratives (i.e., causal and survivor narratives) that have plateaued in quantity of creation, the ongoing narratives are, in some ways, what keep the heritage of these crises still alive because they relate to present-day circumstances.

The scientific narratives pertaining to 9/11 were of a different type than those pertaining to the Bhopal disaster. People predominately shared scientific studies regarding the effects of the Bhopal gas leak and water contamination. Some of these studies were conducted by advocacy organizations while others were geared toward academic research purposes. Although these were in-depth and lengthy reports, there was only a handful that was shared in the social media landscape. On the other hand, there were numerous scientific narratives pertaining to 9/11 that were also much broader in scope. In addition to the many scientific studies that were referenced in the Wikipedia articles and the History Commons timelines, the digital heritage of 9/11 also contains statements from scientists and other accredited professionals that challenge the official 9/11 story. Therefore, the credibility of these scientific narratives was not solely based on scientific findings; instead the reputation and status of these professionals were also important factors in communicating the authenticity of the claims being made. In general, the scientific

narratives of 9/11 and Bhopal indicate that there are not only scientific studies being used to legitimate assertions about these crises, but there are also a wide variety of experts and professionals helping to sustain their living heritage just by publicly acknowledging and promoting these crises.

Last, the narratives regarding the direct actions taken in response to the 9/11 attacks and the Bhopal disaster are comparable in quality but much less so in quantity, since the aftermath of 9/11 is much more far reaching than the Bhopal disaster in the present day. What I presented were narratives that digitally documented direct actions that occurred on the ground but were promoted through social media channels. Some of these narratives also showed examples of people using the web and their online social networks to promote virtual actions that would allow a wider swath of society to participate in these actions. While some of these actions were broad (e.g., signing a petition to demand a new 9/11 investigation or demanding that Dow Chemical clean up Bhopal), other actions were very specific and time-sensitive to current events taking place on the ground (e.g., protesting against the burning of the Quran before the ninth anniversary of 9/11 or protesting at the Live Earth Run for Water events sponsored by Dow), which became ad hoc opportunities to revitalize the memory of these crises through current events. Ultimately, the goals of many of these direct actions that pervade the social media landscape were much broader in scope trying to educate the public on the history of these crises, affect policy decisions related to these crises, and strengthen society's resilience to future crises.

Organizing the social media artifacts based on these five meta-narratives is just one approach to revealing the rich heritage of these crises that still lives on to this day in the social media landscape. The September 11 attacks are one example of a historic crisis with a living heritage sustained substantially through social media. Although mainstream media outlets

continue to report on 9/11 in relation to current events, they often do not cover the same types of 9/11-related issues nor present multiple viewpoints that exist in the social media landscape. What we are beginning to see now is people using social media to make these meta-narratives become more prominent in the mainstream media in an attempt to prevent the official story from dominating the memory of 9/11.

The ecosystem of social media artifacts pertaining to 9/11 highlights a precedent of how social media is being used to sustain the living heritage of 9/11, encompassing the events on the day of the attacks, as well as events that occurred pre-9/11 and post-9/11. Collectively, these digital artifacts have shown a deep reflection of the continuing impacts of 9/11 and its meaningfulness to the present day by opening up questions about values, culture, and politics. Monahan (2010), a sociologist who investigated the media coverage pertaining to 9/11, states:

> *"September 11 became a story primarily about patriotism, loss, and heroes and, for the most part,* not *a story about U.S. foreign relations, U.S. military policy, poor interagency coordination, government inefficiencies, or other interpretive frames" (p. 10)…Clearly, the September 11 attacks were a moral shock. They immediately captivated a vast audience, with most people finding it immensely difficult to make sense of what was happening…This meant that the public had to rely on the media for information and sense-making frames" (p. 59).*

The complexities of the 9/11 attacks and their aftermath "were quickly stripped away" (p. 9) in the mainstream news coverage of 9/11. However, what I found in the social media landscape was a deeper engagement with crafting and telling a more complex story of the September 11 attacks. By taking a critical approach, the heroic and horrific stories were weaved together with the "interpretative frames" that Monahan (2010) speaks of to unveil the root cause of 9/11 based on what has happened since the attacks. The digital heritage of 9/11 shows how the social web world has helped to produce multiple interpretations of 9/11 by reframing these artifacts in opposition to the official story to illustrate the significance of 9/11 in the present day.

CHAPTER 9
SOCIALLY-DISTRIBUTED CURATION

Curators play an important role in our society; they are the stewards of our history. Professional curators have existed for centuries, and they traditionally oversee a collection of artifacts and organize exhibitions at cultural heritage institutions. However, over the past six years, the concept of "curation" has gained popularity in the online world. Figure 60 shows a Google search of the word "curation" between 1950 and 2011 showing a noticeable increase over the past decade. Figure 61 shows a Delicious search of the word "curation" between April 2004 and February 2011 with a noticeable trend in just the past couple of years. What this suggests is a new kind of relevance of curatorship in the digital age.

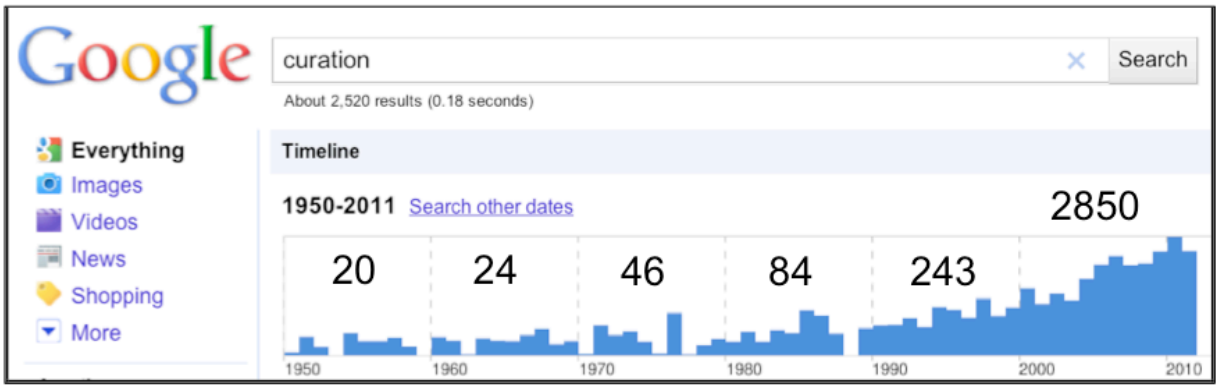

Figure 60: Google Timeline Search on "Curation" Between 1950 – 2011, Number of Results for Every Decade

Figure 61: Timeline of Everybody's Delicious Bookmarks Tagged "Curation" (April 2004 – February 2011)

This chapter discusses the findings from *Part 2: Critiquing Curation* study described in Chapter 5 and then presents a theoretical model called *socially-distributed curation* developed in Part 3. This chapter includes four sections:

- Section 9.1 synthesizes the definition of a "curator" in the cultural heritage domain.
- Section 9.2 synthesizes the definition of "curation" in the social web context.
- Section 9.3 presents my initial conceptual model of curation and explains the assessment of this model by analyzing the curatorial activities of a particular Bhopal meta-narrative.
- Section 9.4 presents the theoretical model of socially-distributed curation by explaining the curatorial activities happening in practice and the technology design implications.

This chapter attempts to show the multi-faceted aspects of curation by providing descriptive findings based on investigations using multiple methods.

9.1 Definition of a Curator in the Cultural Heritage Domain

A curator in the cultural heritage domain is a profession that began as far back as the 1400s. The 2010–11 Bureau of Labor Statistics[218] Occupational Outlook Handbook states:

> *"Curators direct the acquisition, storage, and exhibition of collections, including negotiating and authorizing the purchase, sale, exchange, or loan of collections. They are also responsible for authenticating, evaluating, and categorizing the specimens in a collection."*

This definition provides a general overview of the traditional duties of professional curators. In the next eight subsections I explain specific types of duties that emerged after critically analyzing literature discussing the role curators have played in the past and the evolving role of curators in the present. As mentioned in Chapter 5 Section 5.1.3, I selected five pieces of literature about and from curators to understand the broad spectrum of skills and activities associated with professional curators. My ordering of the literature moves from defining "curators" to defining "curating," which is a shift that also emerges in the social media context.

[218] http://www.bls.gov/oco/ocos065.htm

The first piece of literature is an article by Chambers (2006) titled "Defining the Role of the Curator," which provides analytical findings from synthesizing the job descriptions, job qualifications, and personal statements of more than 200 museum professions in the US who call themselves curators. Chambers concludes that curators are the vehicles for exploring and interpreting particular aspects of culture by building collections, managing collections, conducting academic research, developing exhibitions, and creating educational programs.

The second piece is an exhaustive reference book edited by Thompson (1992) titled *Manual of Curatorship: A Guide to Museum Practice*. It provides a broad collection of 71 articles written by museum specialists with the aim of presenting the practices and issues involved in curatorship. It also covers both the theory and practice of curatorship relevant to staff at museums, art galleries, and libraries.

The third piece is a book edited by Marincola (2000) titled *Curating Now: Imaginative Practice/Public Responsibility*. It contains proceedings from a symposium that involved ten influential curators and art directors from around the world. They discussed the current state of curatorial practice, articulated their professional values, and engaged in a critical dialogue regarding the opportunities and challenges that the field of curating is facing.

The fourth piece is an edited book volume by Thea and Micchelli (2009) titled *On Curating // Interviews with Ten International Curators*. The book presents transcripts of interviews with ten leading international curators discussing their "intellectual convictions and personal visions" as curators particularly when they are involved with "biennials"—mega-exhibitions that occur every two years. During the interviews, they discuss the relationship between the artist and curator as well as how globalism, post-colonialism, capitalism, and the future of cultural tourism have influenced these curators' approach to their work. These

interviews provide a glimpse into the works of independent curators who tend to create exhibitions outside of the museum context.

The fifth piece is a book by Graham and Cook (2010) titled *Rethinking Curating: Art after New Media*. The authors share their own curatorial knowledge and experiences while also reflecting on the impact of new media arts on contemporary art curators. They discuss the similarities of new media art with traditional art as well as the emerging curatorial challenges and opportunities with interpreting, exhibiting, and disseminating new media art.

After coding for different curatorial activities within each of these five pieces of literature, eight themes emerged that explain the historical, theoretical, and intellectual foundations of curators and how the field of curating has evolved. The eight themes are: (1) administration and financial management, (2) collections management and conservation practices, (3) exhibition development, (4) subject specialist developing interpretive materials, (5) communicators and public relations, (6) acting as mediators and brokers, (7) radical and experimental forms of curating, and (8) curating new media art. I begin with the duties and skills of curators that are more prevalent among traditional curators in the professional field. Then, I move towards practices that tend to be at the fringe of the curating field and that overlap with curatorial issues in the social media context. It is important to note that some of the activities within each of these themes overlap, but these themes are intended to isolate the primary roles professional curators typically embody.

9.1.1 Administration and Financial Management

Curators, who work at museums, contemporary art galleries, archives, and other cultural heritage institutions, engage in administrative duties and help with the financial management of these institutions. They oversee the daily operations of the organization and attend board

meetings. They also are involved with personnel management by supervising the staff and training new employees and volunteers. Curators are involved with balancing the budget of the organization or a specific project, obtaining capital funds, soliciting sponsorship, applying for grants, and increasing the membership at their organization as a source of revenue. These administrative duties are often not as visible but curators play a central role in sustaining cultural organizations through these managerial duties. Chambers (2006) points out that "museums have misused the term curator as an indication of administrative authority, and in reference to specific museum functions that are not easily recognizable as curatorial when performed independently of one another" (p. 47). This is in part why the adaptations of the word "curator" tend to not include these managerial duties. Curators merely assist in these tasks that other staff members do as well. Although this managerial role is not the core function of a curator, the skills gained from conducting these duties help to strengthen the skills needed to conduct other curatorial roles.

9.1.2 Collections Management and Conservation Practices

Curators are particularly known for managing collections at cultural heritage institutions and engaging in conservation practices. They are considered the keepers, custodians, or guardians of collections, since they help build them as well as engage in maintenance activities pertaining to the storage of the artifacts in these collections. Such activities speak to the Latin root of "curator," which is *cura* and *curare*—to take care of, to care for, or to cure. During the Roman Empire, the title of "curator" or "caretaker" was given to officials in charge of various departments of public works (e.g., sanitation, transportation, policing, etc.). Then, during the 1660s, curators began to engage in activities that more closely reflect the contemporary roles of curators at cultural heritage institutions.

As part of the duties associated with managing collections, curators are skilled in preserving the artifacts within a collection. This includes the ability to restore and reconstruct artifacts to maintain their physical quality and ensure their authenticity and security. Therefore, curators are adept in disaster planning to safeguard their collections from hazards (e.g., fires, floods, humidity, pests, etc.). It is also important to consider their skills in understanding the ethics, laws, and legislations regarding the credibility of their collections, particularly when these artifacts are reused in exhibits, referenced in publications, or sold for retail purposes.

9.1.3 Exhibition Development

Another important role that curators play is in the development of exhibitions. Exhibitions are platforms for organizing and presenting a set of artifacts from a collection in a meaningful way. To some extent, this is the production function of curators. Developing an exhibition involves actively creating a show or display of some kind. This requires design and narrative skills, where curators weave together a set of artifacts into an architectural and thematic structure producing multiple meta-layers.

According to Hans-Ulrich Obrist, a curator at Musée d'Art Moderne de la Ville de Paris, he explains the evolutionary nature of exhibitions in the following statement:

> *"Instead of certitude, the exhibition expresses connective possibilities… Exhibitions as complex, dynamic learning systems with feedback loops, basically to renounce the unclosed, paralyzing homogeneity of exhibition master plans. To question the obsolete idea of the curator as a master planner. As you begin the process of interrogation, the exhibition is only emerging. Exhibitions under permanent construction, the emergence of an exhibition within the exhibition. This idea of renouncing or questioning a master plan also means that, very often, organizing an exhibition is to invite many shows within the shows" (Marincola, 2001, p. 27)*

Obrist emphasizes the living nature of exhibitions that contrasts typical conceptions of exhibits of being orderly and stable.

Exhibitions are also spatial and visual devices that become the interface between the artists and viewers. The artifacts need to be presented in a way that is digestible and easy to consume so that viewers can make sense of the curator's narrative of the artifacts displayed in the exhibition. Okwui Enwezor, a curator and Senior Vice President at the San Francisco Art Institute, states:

> *"It's interesting to look at the exhibition as a medium that is part of a continuing cultural practice. What comes out of that understanding is a larger awareness of how you tell a story, because exhibitions are narrative by nature…" (Thea and Micchelli, 2009, p. 52).*

The key to developing this narrative is through the presentation of each artifact's textual descriptions. This speaks to how Robert Storr, a senior curator at the Museum of Modern Art in New York, conceptualizes the primary activity of curators. He states, "What we do as curators is a more or less sophisticated version of Show and Tell, information about the things and to present the things themselves" (Marincola, 2001, p. 20). Therefore, in addition to being aestheticians with skills in the external design of exhibitions, curators are also subject matter experts skilled in explaining the meaning of the artifacts through the creation of interpretive materials.

9.1.4 Subject Specialist Developing Interpretive Materials

Curators are subject specialists that develop materials to communicate their knowledge and expertise on a particular topic. According to Chambers (2006), maintaining expert knowledge on a specific subject "remains the most intrinsic characteristic of curatorial work in modern museums" (p. 47). Curators do not only understand the origins of a particular subject, they also recognize the value of the medium in which this subject is communicated. They develop intellectual frameworks on these topics to provide the historical context in which they exist. This includes understanding their spatial and temporal contexts to conduct historical

analyses and produce intellectual critiques. Since curators are subject matter experts, they are able to advise research activities on these subjects, recognize the cultural importance of certain artifacts, facilitate the interpretation of these artifacts, document and catalog these artifacts, and recommend additional items to include in a collection.

When curators are tasked to develop an exhibition, they produce interpretive materials. They are aware of the different interpretations associated with an artifact and are able to explain the meaning of an artifact. They then share this knowledge by writing labels for these artifacts and tell a story that encompasses the set of artifacts on display in an exhibition. The key skill here is communicating the cultural and artistic value of these artifacts and connecting this value to humanistic concerns. Developing the critical meaning of an artifact also means communicating its essential resonance and relevance to society and connecting its existence to local and global contexts. If the artifact is of critical importance to current affairs, curators may produce interpretive materials that communicate a sense of urgency. For some curators, their aim is to communicate a message that is "unlike anything delivered by mass mediums in their ordinary applications" (Marincola, 2001, p. 17). Curators try not to adjudicate or make judgments on behalf of the viewers, but they are sometimes in a position that allows them to elevate the discussion on a particular subject that they find is of cultural relevance.

9.1.5 Communicators and Public Relations

In addition to the curatorial activities that take place behind the scenes, curators also administer user services by acting as communicators and taking on public relations responsibilities. This includes developing educational and instructive materials that are presented at lectures, workshops, or other special events. Many contemporary curators also create and disseminate publications, press releases, and brochures for publicity and marketing purposes.

Additionally, they answer inquiries from researchers and others wanting to learn more about specific collections or exhibitions. Chambers (2006) emphasizes that "the new range of curatorial responsibilities has been just one aspect of the broader shift in museum culture away from collections per se and toward public service and education" (p. 38).

In addition to interfacing more directly with visitors and ushering in new audiences, curators also work directly with educators. In the following quote, Hooper-Greenhill (1992), a lecturer at the Department of Museum Studies at University of Leicester, explains how a curator's communicative skills are critical for improving the visitor experience:

> *"Curators and educators are likely to work more closely together and to share the same goals and objectives. The possibilities of using each other as resources is acknowledged, with the educator making suggestions as to appropriate topical themes for temporary exhibitions, and for relevant and interesting ways of communicating, and the curator helping the educator develop the necessary specialist knowledge about the collections and providing selected objects to be either handled, demonstrated or simply observed more closely than is possible in a display case" (pp. 670-671).*

Therefore, in addition to the curator's responsibility of improving the visitor experience, they also cultivate mediation skills.

9.1.6 Acting as Mediators and Brokers

Curators tend to be the interface between artists, visitors, and other personnel working at cultural heritage institutions. Curatorship is an interdisciplinary practice, where curators have sharpened their ability to bridge between disciplines and participate in cross-departmental collaborations. Obrist describes curators as "junction-makers," who "go beyond the boundaries of disciplines (Marincola, 2001, p. 31). This is critical since "contradictions are inherent in our institutions," according to the museum curator Storr (Marincola, 2001, p. 10). Therefore, curators play a crucial role as negotiators and brokers by mediating the differences between all stakeholders. According to Thea and Micchelli (2009), "the role of mediator is inescapable" (p.

6). This requires skills in listening to all voices, translating and articulating disagreements among the stakeholders, and facilitating dialogue between stakeholders by acting as an interlocutor.

Contemporary curators are increasingly a part of a collective entity, where they must intermingle public and private interests and oscillate between the power and powerless. When Carolee Thea asked Okwui Enwezor, "How did you work with your curatorial team?" Enwezor replied with the following statement:

> *"I was not interested in an advisory role for my colleagues. I wanted a much more involved process—a think tank where everyone had equal opportunity to speak, to introduce ideas, to open new avenues. That didn't mean we weren't working with a set of propositions, which I initially sent to all of them. While the propositions underlying the platforms were previously developed, the content that went into all the platforms was collaborative" (Thea and Micchelli, 2009, p. 54).*

Enwezor's curatorial approach to developing a biennial exhibition was to help maintain the connective tissue between members of his team with an eye towards enabling public understanding of the issues represented in the exhibition. This approach reflects some of the principles emerging among independent curators taking a more experimental approach to curating.

9.1.7 Radical and Experimental Forms of Curating

Although traditional curators work within the confines of cultural heritage institutions, independent curators tend to work outside brick-and-mortar venues by finding alternative spaces that tolerate more radical and experimental forms of curating. Carolyn Christov-Bakargiev, a writer and curator who is the artistic director for the upcoming dOCUMENTA[219] (13) in 2012, explains in an interview with Thea the cyclical evolution of exhibitions:

[219] A well-known exhibition of modern and contemporary art that takes place every five years in Kassel, Germany.

> *"It is interesting to note that in the mid-10th century, the salon emerged from the model of the trade fair. For example, at the first Venice Biennial of 1895, the art was labeled and priced, and the show's success was measured by how many works sold. So from this point of view, the rise of curatorial practice as a field has been positive, moving exhibition-making away from the old fair. With the modernist impulse of the 20th century as well as the autonomy of the artwork and the rise of the radical curator, the exhibition began to slowly detach from the marketplace. And so at the end of this history, we have returned to the beginning, the exhibition as art fair…I believe we are at a point where the system is in crisis. The people who organize and curate feel they need more depth, and this impulse has brought a lot of interesting curatorial experimentation in the 1990s" (Thea and Micchelli, 2009, p. 71).*

Christov-Bakargiev points to the ongoing contention among curators who debate about the core practices and mission that define the field of curating. Some curators have questioned the biases that occur when working in the confines of cultural heritage institutions. For example, Pi Li, a curator, art historian, art dealer, and art advisor in Beijing, questioned the nature of official exhibitions. In the following statement from an interview with Thea, he explains why he chose to open up his own gallery:

> *"One of the reasons I came to open a gallery, Universal Studios, is that I lost faith in large institutions such as biennials and art fairs. These exhibitions at the biennials were not about art but were instead entertainment devices for the public. My impetus came also from the Chinese government's policy of funding* official *art but ignoring local art organizations" (Thea and Micchelli, 2009, p. 101).*

These unofficial and experimental types of exhibitions attempt to subvert traditional hierarchies, stimulate unexpected dialogue, illuminate cultural assumptions, and change the way the audience views the world.

Some radical curators created temporary museums and chose exhibition spaces that were integrated into natural environments or public places. Mary Jane Jacob, a faculty member at the School of the Art Institute of Chicago and the Center for Curatorial Studies at Bard College, New York, explained:

> *"It was a ripe moment for ushering in new audiences to participate in what had been considered an elitist experience. What people say about their places and values is often publicly submerged; the way I work allows for an easier evolution into the mainstream. Visiting the train [the location of her exhibition], for example, gave the audience a moment to reflect—but not through eyes blurred by an esoteric dialectic. The idea was about perception—of our own lives as culture and history" (Thea and Micchelli, 2009, p. 20).*

Jacob draws attention to the importance of facilitating reflection on the part of the viewer. Such exhibits become open-ended experiments questioning "truths" drawn from contemporary culture and society. These types of curators attempt to interweave tradition with innovation. Jacob further points out, "Our mission is to deal with living memory as an important channel for change" (Thea and Micchelli, 2009, p. 26). Therefore, she sees exhibiting not as passive events but rather events that actively engage people towards social change.

These experimental forms of curating produce exhibitions that allow the artifacts to directly interact with society through public places, that facilitate collective forms of re-imagination, and that transform the viewer into an active participant. These types of curators tend to take an activist stance to promote social action and social change, sometimes by eliciting an emotional and bodily response to make the exhibition more evocative and memorable to the viewers. These alternative exhibitions may also facilitate local and global awareness by creating a real-time experience that compels the audience to connect with the present moment and take into account the zeitgeist. Thelma Golden, the Deputy Director for Exhibitions at The Studio Museum in Harlem, New York, points out that the biggest change in the curating field is:

> *"…how a curator can exist in the world, and how our practice can engage with our audiences outside of the institution and how the curatorial voice becomes less a voice speaking to each other and ourselves but can speak in a larger context that allows our vision to move in a significant way out into the world" (Marincola, 2001, pp. 34-35).*

Exhibitions that are significant to the broader world may become more personally meaningful. When they occur outside of the museum and take place in familiar contexts, they become more personal and potentially more meaningful. What we are beginning to see is a rise of new media art being curated, a medium that is becoming more ubiquitous and familiar than artifacts that appear in display cases at white walled galleries.

9.1.8 Curating New Media Art

In addition to the contentious changes taking place within the curating field, the state of the art is also changing from a material-based medium to a digital and more networked-based medium, what many refer to as "new media art." This type of art has appeared in museums and gallery spaces as installations; however, new media art also contains its own platform as a type of exhibition in the virtual space and time, thus making it a more fluid and emergent medium.

The underlying design of the software system in which the new media artifact exists plays a critical role in how viewers interact with the artifact. Typically, this type of art exists within distributed and participatory computer systems that allow the audience to potentially become content providers of the exhibit. This is in part because these software systems are decentralized, networked systems that can facilitate self-organizing and peer-to-peer networking. The following is an example of how an audience (composed predominately of other curators and artists) use new media art to engage in some of the curatorial roles previously mentioned:

> *"What all these [new media art] projects share is a commitment to allowing their 'audience' (curators and artists) to be involved in not only the selection, but also the underlying structure of the online collections: the audience provides the content and helps form the 'folksonomy' for cataloging these emerging forms of art. Such projects' collaborative nature also raises further questions about authorship and ownership in informal and distributed networks and on user-generated content sites. Asking your audience to distinguish and curate the data and metadata of seemingly immaterial works" (Graham and Cook, 2010, p. 270).*

This collaborative approach to engaging the audience in the development of the collections and exhibitions is particularly valuable for addressing "the multiple roles that may be demanded of a curator and can help to build up expertise or pool a range of different skills" needed, especially if the audience was carefully selected based on their background knowledge and skills (Graham and Cook, 2010, p. 284).

These participatory and collaborative effects of curating new media arts also point to an emphasis on "process rather instead of product" (Graham and Cook, 2010, p. 68). Much of curatorial activities in the past were behind the scenes with the products of the exhibition and its artifacts in the foreground. The collaborative curatorial process is the innovative aspect of new media art. New media offers a variety ways to publish, broadcast, distribute, and reproduce artifacts through network technology. The temptation here may be to use automated features to facilitate these curatorial and artistic decisions; however, Graham and Cook (2010) emphasize:

> *"No matter how automated the system or outsourced each of the nodes, there still needs to be an administrator or dedicated group of users, gardening the wiki for weeds (spam), filtering out inappropriate content, updating user accounts, and the like. Here we discover in fact that the curator might be the system administrator or the programmer, controlling access to the network and use of the system" (p. 271).*

Computational forms of curating new media art has its own set of opportunities and challenges that cross over to curation in the social web world. Although the focus here is very much art-oriented, there are many parallels to online curatorial needs in terms of managing digital content.

9.2 Definition of Curation in the Social Web Context

As discussions regarding the role of curators become more contentious in the cultural heritage domain, the role of curation in the social web context is becoming more pertinent. As mentioned in the introduction of this chapter, the concept of "curation" has gained momentum

and has become a buzzword over the past couple of years. It shifted from the idea of "digital curators" and "content curators" to "content curation" and "social curation" with an emphasis towards the activities and skills involved with curating. The definitions of curators and curation in the social web context vary. In this introduction to this section, I provide snippets of how social media evangelists explicitly define these terms over the past year and a half. In the following subsections, I discuss seven themes that emerged after critically analyzing 209 web artifacts discussing this new form of curation emerging from the social web.

On September 30, 2009, Rohit Bhargava[220] wrote a blog post titled, *Manifesto For The Content Curator: The Next Big Social Media Job Of The Future?*. He proclaimed, "A Content Curator is someone who continually finds, groups, organizes and shares the best and most relevant content on a specific issue online." He then included the following job description or "manifesto" for a content curator:

> *"In the near future, experts predict that content on the web will double every 72 hours. The detached analysis of an algorithm will no longer be enough to find what we are looking for. To satisfy the people's hunger for great content on any topic imaginable, there will need to be a new category of individual working online. Someone whose job it is not to create more content, but to make sense of all the content that others are creating. To find the best and most relevant content and bring it forward. The people who choose to take on this role will be known as Content Curators. The future of the social web will be driven by these Content Curators, who take it upon themselves to collect and share the best content online for others to consume and take on the role of citizen editors, publishing highly valuable compilations of content created by others. In time, these curators will bring more utility and order to the social web. In doing so, they will help to add a voice and point of view to organizations and companies that can connect them with customers—creating an entirely new dialogue based on valued content rather than just brand created marketing messages."*

Many others now reference this manifesto widely as well as augment this description with their own interpretation of a curator in the digital age. Bhargava's manifesto also reflects the initial

[220] http://www.influentialmarketingblog.com/weblog/2009/09/manifesto-for-the-content-curator-the-next-big-social-media-job-of-the-future-.html

fervor around adopting the notion of "curator" to the ever growing problem of information overload.

On December 8, 2009, Erin Scime[221] wrote a blog post titled *The Content Strategist as Digital Curator* and provided an in-depth treatment of what it means to be a "digital curator" and to conduct "online curation." In the following quote, she emphasizes the editorial activities involved with curating exhibitions that often are not frequently discussed in the application of this word to the social web:

> *"As if hanging art, the editor-as-digital-curator thoughtfully examines how to strengthen primary content (editorial features) by positioning it with related content elements to support a thesis. But it's not just that simple. Unlike physical gallery space, the web is a far less constrained space, which offers access to multiple dimensions of content at once. Whether the content is timely (headlines and new content) or timeless (evergreen = archival content that maintains relevance by retaining encyclopaedic qualities), online curation is about selectively and effectively balancing these space-time factors to create context in order for the site to feel alive, relevant, and worth returning to. That said, juxtaposing timely and timeless content is something that few sites do well."*

Scime points to an important skill among curators working in galleries and museums: the ability to juxtapose content that has real-time value with content that has historical value. Professional curators at historical museums tend to handle relics from a distant past; however, the concept of curation is gaining traction online because of its value to the real-time web. The need for real-time curated content has particularly shown significance during recent disasters.

After the February 27, 2010 Chile earthquake and the tsunami warnings that were issued in 53 countries, Paul Gillin[222] wrote a blog post on March 4, 2010 titled *Curation's Growing Value*, where he discusses how he found curated content in Twitter to follow this impending crisis in real-time. He goes on to explain the importance of curation in the following statement:

[221] http://www.alistapart.com/articles/content-strategist-as-digital-curator
[222] http://gillin.com/blog/2010/03/curations-growing-value

> *"No longer is our problem lack of information; it's that we're drowning in information. That's why curation is so important. Trusted curators who point us to the most valuable sources of information for our interests will become the new power brokers."*

Gillin draws attention to another important skill that curators possess: finding the gems within the tsunami of information. This speaks to one of the growing trends in how people interpret the notion of curation for the social web context. The emphasis tends to be on filtering or rather finding the signal within the noise of content. However, some have pushed back on the equating curating with filtering.

On March 22, 2010, Taariq Lewis[223] from HiveFire wrote a blog post titled *Is Content Curation anything like Museum, History or Library curating? We say Yes*. In this post, he discusses why curation is much more than filtering in the following statement:

> *"Curating is* **not** *about general bookmarking and filtering activities. Content curating must include the analysis and organization a comprehensive collection of linked information artifacts. Content curating must then present this information for the public in a format that allows easy understanding of the relationship between these artifacts of content."*

Lewis points to the curatorial activity of making meaning out of the collection of filtered artifacts. This requires some form of research commitment to investigate the significance of these artifacts as well as presentation skills to communicate the value of this collection of artifacts.

On March 27, 2010, Robert Scoble[224] wrote a blog post titled *The Seven Needs of Real-Time Curators*. He first defined a curator simply as "an information chemist." If one considers a tweet from Twitter or a photo from Flickr as an atom, then this information curator "mixes atoms together in a way to build an info-molecule [and] then adds value to that molecule." In his post,

[223] http://www.contentcurationmarketing.com/articles/3791/is-content-curation-anything-like-museum-history-o
[224] http://scobleizer.com/2010/03/27/the-seven-needs-of-real-time-curators

he lists the following seven requirements to support a "real-time curator": Tools that would allow curators to (1) bundle digital content together, (2) reorder this content based on their importance, (3) distribute bundled content across multiple channels, (4) editorialize the bundled content, (5) update the bundled content over time, (6) add participation widgets to support conversations around the bundled content, and (7) track audience engagement with the bundled content. These seven requirements speak to some of the features that are beginning to appear in web services that have recently been launched. Scoble, a technical evangelist, is well known for his interviews with developers working on web services that use the word curation to describe their service. Some of these web services are Storify,[225] Curated.by,[226] Pearltrees,[227] PostPost,[228] DataSift,[229] Curata,[230] Publish2,[231] Ushahidi,[232] and SwiftRiver.[233]

Between September and October 2010, Robin Good[234] created a series of blog posts that began with the title *Real-Time News Curation – The Complete Guide*. In this series of seven posts, he explains what real-time news curation is, why it is going to be so relevant, how it came to be, how it is done, what tools and skills you need to do it, what tools and technologies are needed, what curation services and tools exist, what the ideal news curation system features set looks like, and what the future is going to look like. Good provides a comprehensive and practical guide to what "real-time curation" means and how to implement it particularly in the news context.

[225] http://storify.com
[226] http://www.curated.by
[227] http://www.pearltrees.com
[228] http://www.postpost.com
[229] http://datasift.net
[230] http://www.getcurata.com
[231] http://www.publish2.com
[232] http://www.ushahidi.com
[233] http://swift.ushahidi.com
[234] http://www.masternewmedia.org/real-time-news-curation-newsmastering-and-newsradars-the-complete-guide-part-1

HiveFire is a company that created Curata, which supports content curation and content marketing. They decided to put their product into practice by using their Curata system to curate online posts about content curation available at their blog ContentCurationMarketing.com. In addition to conducting Google and Delicious searches on how people define curation in the social web world, HiveFire's blog[235] became a functional resource for this research study in terms of finding relevant web posts discussing the meaning of curation in the web context.

Recently in March 2011, Steven Rosenbaum published a book titled *Curation Nation: How to Win in a World Where Consumers are Creators*, where Rosenbaum "curates the curators." The book is a detailed journey into the word "curation" by weaving together insights from top thinkers in media, advertising, publishing, commerce and web technologies. As he unveils the history behind this emerging practice in the digital world, he explains how a curator is now a brand and that "curation" is becoming the "new way of organizing the web going forward." Rosenbaum's journey into the word "curation" reflects a similar journey that I have taken in my *Critiquing Curation* study.

In the previous section, I discussed the traditional role of professional curators, the emergence of radical curators, and the rise of new media art curators to provide a historical journey into curation from the cultural heritage domain. In the introduction to this section, I provided a chronological journey into the meaning of curation in the social web context. In the following subsections, I present seven themes that emerged from analyzing the 209 web artifacts that explain the meaning and value of curation in the digital age. They are available through Delicious.[236] These seven themes are: (1) aggregation and categorization, (2) beyond aggregation towards filtering, (3) vetted sources and trusted filters, (4) providing meaning and context, (5)

[235] http://www.contentcurationmarketing.com
[236] http://www.delicious.com/grassrootsheritage/curation

organizing and distributing curated content, (6) human-algorithmic curation, and (7) social curation. These themes are partly ordered chronologically in terms of the thematic evolution in how people in the social web world describe curation.

9.2.1 Aggregation and Categorization

As mentioned in the previous section regarding the curatorial duties as a profession, curators are most often known for managing and taking care of collections, which entails the aggregation and categorization of the items within a collection. Therefore, it is not surprising that the initial interpretation of curation involved aggregating and categorizing. Yet, it is important to recognize that these collections typically contain content not created by the curators themselves. Rohit Bhargava[237] points out in a blog post titled *How To Use Curation To Make Your Blog Better: Lessons From Postsecret*:

> *"Curation evokes that powerful idea of working on something larger than yourself. Museum staff curate the works of art and historical significance that line their walls. National archives that store the lessons of the world's past are similarly curated."*

In other words, curators aggregate content with the goal of showing what Aristotle famously recognized, which is that "the whole is greater than the sum of its parts." The act of gathering relevant content can provide value to those who do not have the expertise to know where to find this content. At the same time, building a collection requires the forethought of identifying the importance of aggregating such content for the greater good of society. A well-curated collection aggregates content but may have not been initially related or connected; therefore, it is the aggregation of disparate items that can provide new insights that were not visible before.

What has emerged from the web is the aggregation of hyperlinks, since the foundation of the web is the links. The web itself is merely a collection of linked pages. According to Josh

[237] http://rohitbhargava.typepad.com/weblog/2009/01/how-to-use-cura.html

Korr[238] in a blog post titled *A 21st Century Newswire—Curating the Web With Links*, he states that in the web age, the goal is "not to provide full-text versions of a handful of sources' news, but to offer links to the best stuff culled from all sources." In the online news industry, this is sometimes called "link journalism" where the reporter's major offering is a collection of relevant links.

During the process of aggregating content and links to other relevant content, categorizing the items within these collections also occurs. This classification process of taxonomic labeling and folksonomic tagging takes place at multiple levels. As a content strategist, Erin Scime[239] states in a blog post titled *The Content Strategist as Digital Curator* that part of her curatorial activities involves creating structure using classification schemes (e.g., taxonomy or folksonomy), developing ontologies to show the relationships between the categories, and using standards like search engine optimization (SEO), the semantic web, or other systems that allow the creation of metadata to ensure that the "content can easily be cross-linked and dynamically served within the site as well as more effectively integrated in cases of syndication." Additionally, the development of categories and tags may be done by the creator of the content, the users of the content, or even a software system scraping the content to automatically produce keywords for it.

9.2.2 Beyond Aggregation: Towards Filtering

Over time, the adoption of the word curation moved beyond aggregation and more towards filtering. This may in part be because many of the tools that are now available are able to easily aggregate information into a stream of content, such as through search engines and RSS feed readers. The challenge now is finding the gems within this aggregated collection, especially

[238] http://www.nieman.harvard.edu/reportsitem.aspx?id=100710
[239] http://www.alistapart.com/articles/content-strategist-as-digital-curator

when this collection is a growing stream of content leading to a feeling of "information overload." Therefore, many social media evangelists assert that curation is not about aggregation but rather about carefully selecting and pruning from the aggregated collection. Yet, Mike Shatzkin[240] points out in a blog post titled *Aggregation and curation: two concepts that explain a lot about digital change* that "aggregation without curation is, normally, not very helpful [since] *no* content makes its way from its creator to the public without aggregation." Shatzkin's argument is valid in that aggregation will always be a part of the curatorial process.

Still, many social media evangelists are beginning to draw attention to the more critical component of curation that moves beyond just a simple form of aggregation. For example, Clay Shirky[241] gave at talk at the Web 2.0 Expo titled *It's Not Information Overload. It's Filter Failure*. He stresses that society has always had a problem of information overload ever since the 1500s with the emergence of the printing press. What has changed is that "the filter for quality is way downstream from the site of production." What Shirky argues is that the old publishing filters are breaking and the need for designing new filters for web content is on the rise.

The challenge that developers now face is determining the type of filters that people need in the web age to be able to sip from the fire hose of content. Most social media experts broadly state that the need for curation is to find, sort, and select the "best" and most "relevant" and "valuable" content. Yet, determining what is "best" or most significant is a subjective editorial process that means different things to different people, depending on the user's needs. Many people tend to use the phrase "finding the signal in the noise" as well as "separating the wheat from the chaff" as expressions to define filtering in the digital age. In the following snippet from

[240] http://www.idealog.com/blog/aggregation-and-curation-two-concepts-that-explain-a-lot-about-digital-change
[241] http://www.youtube.com/watch?v=LabqeJEOQyI

a blog post titled *Can 'Curation' Save Media?*, Steve Rosenbaum[242] uses the latter phrase and links filtering to editorial activities:

> *"Curation is the new role of media professionals. Separating the wheat from the chaff, assigning editorial weight, and—most importantly—giving folks who don't want to spend their lives looking for an editorial needle in a haystack a high-quality collection of content that is contextual and coherent."*

This need for filters that provide "contextual and coherent" collections reflects the vision of the semantic web, where search results become more personalized and customized to each user. Ultimately, what the editorial function of a curator means is having the ability or tools to extract the significance of the aggregated collection of content so that consumers can easily digest and make sense of it.

Filtering for high quality content not only requires editorial skills, but also a sense of responsibility for the decisions made to select, remove, and organize the content. Robin Givhan[243] states in a Washington Post article titled *Citizen Curators' Two Centers: Worth Every Penny*:

> *"Museums don't* own *culture, but they sort through it, rank it and attempt to make some sense of it. Theirs aren't the only valid points of view, but they are especially valued because they're the result of research, dispassionate analysis and intellectual curiosity."*

As a journalist, Givhan draws attention to an important characteristic of editing and filtering, that it must be a reputable filter to ensure the authenticity of the collection and its contents.

9.2.3 Trusted Filters

Filtering for the "best" and most "relevant" content also means that a trusted source conducted the selection process. The judgments are vetted to imbue a feeling of authority and

[242] http://www.businessinsider.com/can-curation-save-media-2009-4
[243] http://www.washingtonpost.com/wp-dyn/content/article/2007/12/21/AR2007122100717_pf.html

credibility in the collection of content presented. In a blog post titled *Why Curation Is Important to the Future of Journalism*, Josh Sternberg[244] states:

> *"Building trust is important to validating curation as an evolutionary form of journalism, and many curators believe they should be held to the same standards as journalists. Ethical standards and transparency (like citing/crediting sources) are essential in building trust in a curator."*

Sternberg draws attention to the importance of authenticating and managing intellectual property as a way of gaining trust. However, the legality around reusing copyrighted content in the web context is still up for debate, as it can be both beneficial and detrimental to the copyright owner. At the same time, Mindy McAdams[245] explains that curation is "a careful process, with research and fact-checking and solid sourcing underneath it." Therefore, an important aspect of curation is conveying that the selected content was validated and is reputable.

9.2.4 Providing Meaning and Context

Beyond the need to validate the curated content is the need to provide meaning and context to better understand its significance. This entails the inclusion of other content as background information. Steve Dietz[246] stated in a talk he gave at the 1998 International Conference on Museums and Web called *Curating (on) the Web*:

> *"The emphasis will shift from simply 'creating' content to presenting a context for it; a point of view about it—just as one of the roles of the curator is to identify, contextualize, and present a point of view about works of art. While lots of museum Web sites have lists of links, few tend to 'curate' these links or offer much reason for listing them beyond a generic 'sites to check out.'"*

It is easy to list a set of links; that is why the real work of the curator is in creating meaning and helping the viewers make sense of the content so that they can understand the broader context in which the content exists. Rosenbaum suggests that after finding the best content or links on the

[244] http://mashable.com/2011/03/10/curation-journalism
[245] http://mindymcadams.com/tojou/2008/curation-and-journalists-as-curators
[246] http://www.afsnitp.dk/onoff/Texts/dietzcuratingont.html

web, then these links need to be weaved together in a way that presents a coherent theme in a form of a story.

At the same time, Matt Cohen[247] emphasizes in a blog post titled *Curationism: New Rules for Web Media, Part 1* that providing meaning requires an editorial voice that presents the story in context, with commentary and a sense of perspective and personality. In some ways, this is how curation adds value and why Rosenbaum[248] claims, "a curator is a brand," which is predominately how social media evangelists are framing the value of curation—a new practice that is facilitating "brand marketing." Yet, Steve Rubel[249] frames the role of the curator in a slightly different way in his blog post titled *The Digital Curator in Your Future* by stating, "The call of the curator requires people who are selfless and willing to act as sherpas and guides." In the process of providing meaning and context, the curator does indeed act as a guide by recognizing the patterns emerging from the collected content and explaining the relationship between the contents in a collection.

9.2.5 Organizing and Distributing Curated Content

Conveying the relationships between items in a collection involves organizing and distributing this curated content in a purposeful way to the extent that it produces a meaningful and memorable experience. Erin Scime and Mindy McAdams both emphasize how traditional curators produce "thoughtful exhibitions" through the "arrangement or juxtaposition" of the items that were strategically selected for the exhibits "to engage the audience, convey a message, and inspire action." Scime particularly points out how social media analytics not only "map how visitors move through content, identifying areas of interest," but they also "are a curator's

[247] http://www.facebook.com/note.php?note_id=47527867263
[248] http://www.youtube.com/watch?v=QO_rzYpm1D4
[249] http://www.micropersuasion.com/2008/02/the-digital-cur.html

greatest weapon in determining what should be created, what should remain on display, and what should rotate into storage or retirement." One of the commenters to McAdams blog post states, "Curators of good stories can create the opportunity for exploration—taking the user by the hand and leading them through a topic, rather than sending them back to Google."

In the context of the web, curated content can be dynamically organized and widely distributed to better communicate the meaning and context of the curated content. As "curation" continues to be used as a buzzword online, social media and recently developed web services are becoming the platforms and delivery methods for re-presenting this curated content. Thus, curation in the social web context requires attention to designing a meaningful experience at the human-computer interface level as the new exhibition medium.

9.2.6 Human-Algorithmic Curation

Although many of the curatorial activities discussed in the current and previous sections are manual processes, curation in the social web context also includes algorithmic curation. Some often refer to Google as the ultimate curator by mastering algorithmic search. The PageRank algorithm has essentially automated the process of categorizing, deciding relevance, and assigning authority. However, it is important to recognize that the power in this algorithm is largely based on human actions that have been scraped by a machine. Therefore, algorithmic curation will always involve a human element in terms of the development of the algorithm and the calculation of linking activities by web users. Jeff Jarvis[250] summarized this issue with the following tweet: "Or: algorithm-aided human writing will meet human-aided algorithmic curation; quality will rise." One cannot ignore the fact that web users are always relying on algorithms to find content when using search engines, but human discernment tends to be the

[250] http://twitter.com/jeffjarvis/status/6640900496

final deciding factor. In some ways, algorithms are being used to augment human curatorial activities in the social web context. For instance, social media users tend to select and view content based on the number of views, ratings, and/or friends/followers/subscribers, all of which are calculated using algorithms and become algorithmic recommendations. The power of the algorithm lies in conducting tasks that humans cannot do manually or would not want to do.

Although algorithmic curation is beginning to dominate the descriptions of many emerging web services in the social media context, social media evangelists continue to foreground the importance of human judgment. For example, Matt Chandler[251] explains in a blog post titled *Content Curation to Build Trust*:

> *"Content that's recommended (curated) catches our attention because we know someone sat down and thought about the value of that story. Whether we know the recommending party directly (our Facebook friends and Twitter contacts) or not (Slate or Washington Post editors), we're conscious of the fact that a human being thought a particular story was important enough to warrant prominent placement. That's a feeling of confidence and trust no computer algorithm can provide."*

The human voice that comes from personal recommendations and an explanation of why certain content is being shared is a critical component of curation in the social web world. Pete Cashmore[252] states in a CNN article on the *10 Web trends to watch in 2010*:

> *"In the attention economy, with its millions of daily status updates and billions of Web pages vying for our time, how do we best allocate that scarce resource? One solution has been algorithmic: Sites like Google News source the best stuff by technical means, but fall short when it comes to personalization."*

The personalization that Cashmore speaks of is the value of social curation.

[251] http://www.marketingtechblog.com/blogging/content-curation-to-build-trust
[252] http://www.cnn.com/2009/TECH/12/03/cashmore.web.trends.2010/index.html?iref=allsearch

9.2.7 Social Curation

What is beginning to emerge in the social media landscape is what some refer to as "social curation." This could mean crowdsourced curation involving people who are strangers to each other or curation involving one's social graph. Crowdsourced curation relies on the "wisdom of the crowd" or rather the collective power of the wider public to refine a body of knowledge. This type of curation does not occur randomly but instead encourages those who have expert knowledge on a particular topic to collaborate and enrich the body of knowledge. According to Josh Korr, he argues:

> *"But no one entity—be it a wire service or a news organization—can possibly track what's appearing in all papers, large and small, blogs, magazines and Web sites. Nor could any one news organization acquire the rights to all of this material. The great thing about the Web is that you don't have to pay anyone to help you bring great stories to readers—just link to ones already there."*

What Korr alludes to is the need for and the rise of collective intelligence, where curation becomes a distributed process augmented by sociotechnical systems. This form of social curation occurs by casting a wide net to ensure that unconnected experts on a subject are still able to share their knowledge.

Yet, social curation tends to involve one's personal network by capitalizing on these trusted relationships. The phrase "social beats search" is beginning to gain traction as search engines become infested with spam and less relevant to its users. According to Pete Cashmore, he states how "your friends are your filter" and "your friends are becoming the curators of your consumption." Much of why this is becoming a growing phenomenon is because of the rising use of social media, which are sociotechnical systems that automatically aggregate and re-present social content. Although people have always and will continue to rely on their friends to find relevant and reliable information, social curation through social media is still highly dependent

on algorithms and technological systems to aggregate and communicate these social recommendations.

As a final point, social curation also means facilitating discussions and conversations. According to Erin Scime:

> *"....the content-strategist-as-curator is the invaluable human presence. They play the role of the guide (docent) by proposing topics for discussion. They set expectations and tone and then steer the conversation when it becomes stale or off-track. This is why the content strategist often becomes a subject-matter expert who can effectively define and manage the rules of play and then stimulate conversation, communicate insights, and extend general knowledge to build trusting relationships."*

Therefore, curation goes beyond just aggregating and filtering to valuing engagement by soliciting audience feedback and cultivating these social relationships. These relationships can become a critical resource for not only improving one's own curatorial skills but also for requesting one's own curatorial needs.

9.3 Analyzing the Curatorial Activities of Crisis Narratives

After synthesizing the definition of curators as a professional practice with the emerging adaptation of curation in the social web context, I then developed an initial conceptual model of curation as a representation of what curation means. This section presents the initial conceptual model of curation and the process of assessing this model by using it as a guide to analyze the curatorial activities of a particular Bhopal disaster meta-narrative. The purpose of this assessment was to critique the initial conceptual model of curation to inform the production of a theoretical model of socially-distributed curation.

9.3.1 Initial Conceptual Model of Curation

The different duties and skills that emerged from synthesizing the meaning of curators and curation led to the development of an initial conceptual model of curation (Figure 62) organized based on seven archetypes and activities associated with each archetype.

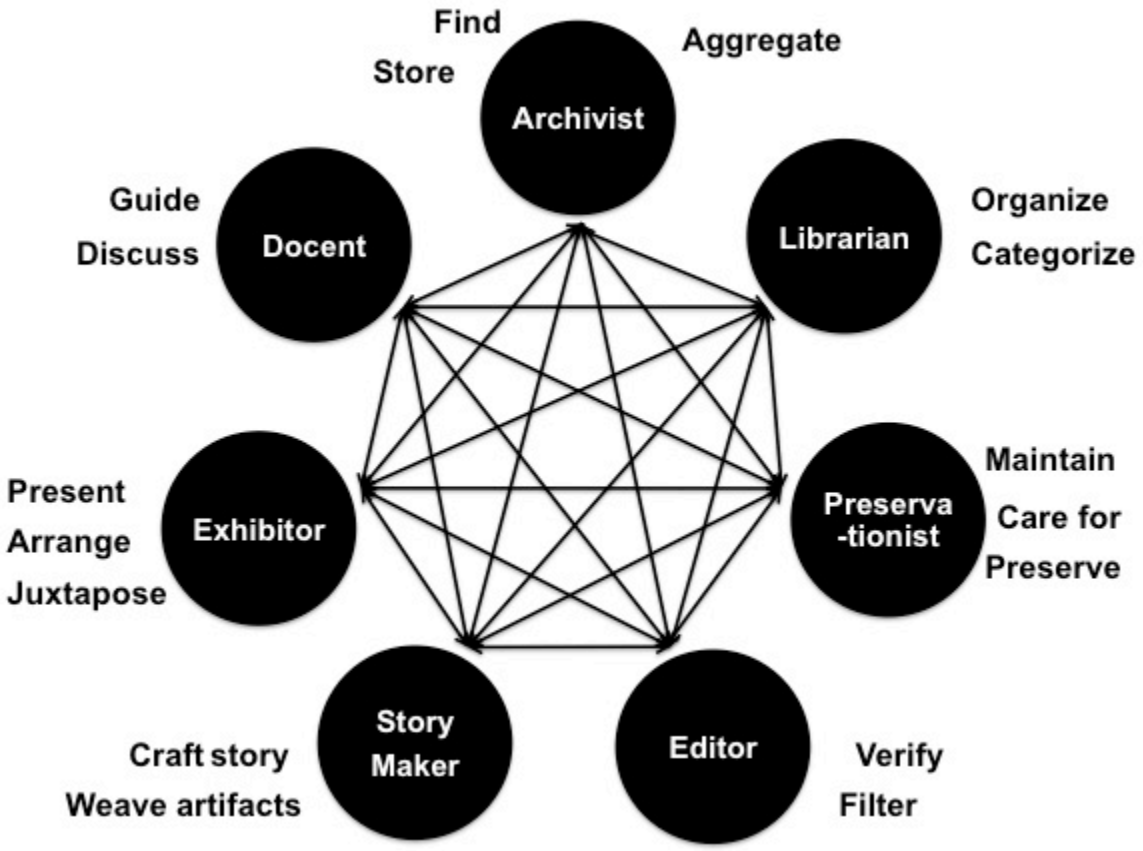

Figure 62: Initial Conceptual Model of Curation

Like an **archivist**, the curator *obtains*, *collects*, and *stores* a representative set of artifacts. Like a **librarian**, the curator *organizes*, *categorizes*, and *generates* metadata to add value to the artifacts. Like a **preservationist**, the curator *preserves* and *safeguards* the artifacts for long periods of time. Like an **editor**, the curator *filters* for high quality, relevant, and reputable artifacts and *verifies* their authenticity. Like an **exhibitor**, the curator *displays*, *arranges*, and *juxtaposes* a chosen set of artifacts to create a compelling experience and evoke a response. Like

a **story maker**, the curator *crafts a story* by weaving together the selected artifacts and by producing interpretational material to *communicate a message* to the audience. And like a **docent**, the curator *guides visitors* and *facilitates discussions*. This diverse set of curatorial activities illustrates how *curation* is a multi-faceted construct.

9.3.2 Assessing the Curatorial Activities of the Bhopal "Second Disaster" Narrative

To assess the initial conceptual model of curation, I chose a specific narrative that emerged from the crisis case studies to compare the broad interpretations of curation with the curatorial activities happening in practice in the social media landscape. The ongoing narrative about the "second disaster" pertaining to the 1984 Bhopal gas leak was selected because it is a containable narrative that unexpectedly emerged from my analysis.

The "second disaster" refers to the contamination of the underground water supply in Bhopal, India due to the leaking chemicals that were left at the Union Carbide pesticide plant and the toxic waste dumped at solar ponds in Bhopal. Some have estimated that 30,000 Bhopal residents have been affected by water contamination because many of them use it for drinking water, bathing, and other daily needs. Many of them now report serious health effects including skin disorders, missing palates, and a wide range of birth defects. Some argue that this environmental hazard began when Union Carbide opened its Bhopal plant in 1968 and began dumping toxic waste in nearby solar ponds.

The purpose of selecting a particular ongoing narrative from the Bhopal case study is because this disaster has a manageable web sphere and contains a finite number of data points pertaining to this water contamination issue. It is also an appropriate example of an ongoing crisis in Bhopal that is central to the living heritage of the Bhopal disaster. A compelling aspect of the "second disaster" narrative is that it was not a result of the 1984 gas leak. As mentioned

earlier, the cause began as far back as 1968 and still continues to today because the chemicals have not yet been cleaned up at the pesticide plant. However, this slow onset crisis was able to finally get attention after the 1984 Bhopal gas leak, since this leak was the largest industrial disaster in the world and has become an important launching point for highlighting this ongoing crisis. Although the cause is slightly different, both crises involve the Union Carbide Corporation, which is now Dow Chemical Company, and both crises are causing similar health effects that tend to only occur in Bhopal.

After carefully attending to the analysis of all the narratives and meta-narratives for each crisis, it was evident that the "second disaster" narrative regarding the water contamination issue in Bhopal is a salient example of using social media to sustain the living heritage of historic crises. There was a strong urge to remember the 1984 gas leak, but what percolated through the social media landscape was this second disaster as it got attached to the 1984 Bhopal gas leak narrative. This narrative had a strong force around it to keep it alive, since it is one of the more unknown narratives that stand outside the usual and official reporting of the Bhopal disaster. Even the Wikipedia page is titled *Bhopal disaster* instead of just referring to it as the 1984 Bhopal gas leak. Although referencing it to the gas leak helps keep it alive, some social media users and stakeholders strategically try to make this disaster distinct to prevent people from confusing it with the gas leak that happened 26 years ago. Therefore, this narrative is a key example of why it is important to keep certain memories alive and treat it as part of the living heritage in Bhopal.

With this in mind, the goal of assessing the initial conceptual model of curation was to examine whether social media users were engaging in curatorial activities to take care of and pass on the message about the "second disaster" in Bhopal. The assessment consisted of creating

a spreadsheet to calculate the degree to which the seven curatorial activities occurred across five social media services regarding the "second disaster" narrative. For each of the seven curatorial activities, I chose three to four keywords that represented the primary actions associated with that curatorial activity. The following is a list of the archetypes and keywords:

- **Archivist**: identify, find, gather, collect
- **Librarian**: categorize, tag, label, organize
- **Preservationist**: store, maintain, copy, republish
- **Editor**: filter, select, assess, verify
- **Story Maker**: synthesize, provide context
- **Exhibiter**: display, distribute, juxtapose
- **Docent**: guide, discuss, mediate, reflect

For each of the five social media services, I chose a set of data points unique to each social media service that were at an appropriate level of analysis for examining the seven curatorial activities. They had to be large enough data points to encompass curatorial activities at a socially-distributed level. For example, Facebook groups were chosen because the social features and practices within these groups encompassed the degree of curatorial activity I focus on in this dissertation, whereas wall posts that appear in a Facebook group were too small of a data point to examine the socially-distributed aspects of curation. The following is a list of the social media data points chosen across each of the five social media services:

- **Facebook**: group, page, cause
- **Flickr**: group, photostream, sets, photos
- **YouTube**: channels, playlists, videos
- **Twitter**: September, October, November, December 2010 tweets
- **Wikipedia**: article with discussion page, category

After finding 136 data points across the five social media services pertaining to the "second disaster" in Bhopal, I used a rating scale to evaluate the amount of curatorial activity for each data point across each of the seven curatorial activities. For data points that exhibited a high amount of activity related to filtering, for example, I would mark it with a "2" and a green checkmark. If the data point exhibited some activity related to categorizing, for example, I would mark it with a "1" and a yellow exclamation point. If the data point exhibited no activity related to juxtaposing, for example, I would mark it with a "0" and a red "X" mark. After examining each data point, the average was taken across the total dataset for each of the seven curatorial activities as well as for each of the five social media services. The analyses are available in Table 23 over the next 5 pages and is also discussed in Section 9.4. After conducting this assessment, I was able to critique my initial conceptual model of curation and offer a more elaborate and critical understanding of curation by developing a theoretical model of socially-distributed curation, which is presented in Section 9.4.

Table 23: Assessment of Curation Model for Bhopal "Second Disaster" Meta-Narrative

Ongoing Bhopal Narratives: Second Disaster, Water Contamination, Cleanup
[Note: 2 = High Activity, 1 = Low Activity, 0 = No Activity]

Social Media Service	Data Point	Name and Link to Data Point	Archivist: identify, find, gather, collect	Librarian: categorize, tag, label, organize	Preservationist: store, maintain, copy, republish	Editor: filter, select, assess, verify	Story Maker: synthesize, provide context	Exhibitor: display, distribute, juxtapose	Docent: guide, discuss, mediate, reflect	Description of Curatorial Activity
Facebook	Groups	Bhopal GaS Tragedy [25,000+ dead and counting] Facebook group volunteer organization	2	2	2	2	1	2	2	Admin posted most wall posts all of which are just links, he also "liked" the posts other people posted, no discussions or comments between members, some photos preserved, mainly copy/pasted web content, credentials based on weblink, long description but it was copied from an article online
		no more bhopals Facebook group common interest activities	0	2	0	0	0	0	0	Only 4 members, no posts, no content, only category and description of group
		Bhopal Gas Tragedy ...a shame on Indian Government,a travesty of justice.. Facebook group common interest beliefs and causes	1	2	1	1	2	1	2	Sharing of links, one spam post, some discussions between members
		Bring justice to Bhopal gas tragedy victims. Facebook group	2	2	0	1	2	1	2	One admin posted most materials, copy/pasted news articles as discussion posts, 32 admins but only the creator posted items
		Justice for Bhopal gas Tragedy Victims Facebook group	1	1	1	1	2	2	2	Over 3,000 members mainly discussing, not many links, some spam, more wall posts from a variety of members
		Justice for Bhopal Facebook group - common interest beliefs and causes	2	2	1	1	2	1	1	Only 37 members but does provide a helpful synthesis in description
		Protest Against Bhopal Judicial Disaster Facebook group common interest current event	2	1	2	2	2	2	2	Over 1,600 members, different members make wall post, some with comments, more posts about reflections
		The Truth about Live Earth and Dow Chemical Facebook group organizations	1	2	2	2	2	2	2	Over 470 members, some very long wall posts, more commenting on people's wall posts, some images
		BHOPAL XXV Facebook group organizations	2	2	2	2	1	2	1	About 370 members, based on images that are shared in the photos section as a copy, some comments, more labeling of links shared
		Bhopal Gas Tragedy ....a shame on Indian Government,a travesty of justice.. Facebook group common interest beliefs & causes	2	2	1	1	1	1	1	Just over 120 members, some wall posts from other members, more discussions
		The Unfinished Story of Bhopal 1984 Facebook page	2	2	2	1	1	1	0	Creator of page finds relevant up-to-date links and post them on the wall, Likes to other related Facebook groups/pages, people liking some wall posts but not a lot of engagement
		Bhopal Gas Tragedy - World's Worst Industrial Disaster awaits Justice Facebook non-profit org page	1	2	2	1	1	1	0	Only one post not from creator that mentions the water contamination, links with explanatory text
		SUPPORT TODAYS VICTIMS OF 1984 BHOPAL CHEMICAL DISASTER and BOYCOTT DOW !!! Facebook group advocacy organization	2	2	1	1	2	2	2	In depth description or story, more commenting and engagement between members, some spam
		Students For Bhopal Facebook group advocacy orgnaization	2	2	2	2	2	2	2	Over 1,900 members with 9 admins, a lot of engagement from members, more descriptions added to shared links
		Indra Sinha begins hunger strike over Bhopal Facebook group common interests politics	1	2	1	1	1	2	2	Around 490 members with 2 admins, some spam, engagement fromm members, some descriptions with shared links
	Pages	Bhopal Gas Tragedy 1984 Facebook community page	1	2	2	1	2	1	1	Creator of page tends to share links and resources, more photos with juxtapositions
		Justice for Bhopal Gas Tragedy Victims Facebook community page	1	2	2	1	2	1	2	More comments and rhetorical questions among members/fans
	Causes	Campaign for Justice in Bhopal	2	2	2	2	2	2	2	Over 2,200 members, donated over $4,200, indepth description with latest bulletins
		Justice for Bhopal	2	2	2	1	2	2	2	Over 4,000 members, donated over $380, indepth description with latest bulletins, some spam
		One Night in Bhopal -- The World's Most Horrific Gas Accident	1	2	1	1	2	1	0	Only 21 members, donated $25, indepth description, creator of cause shows the most activity
		International Action for Bhopal	2	2	2	2	2	2	2	Over 4,300 members, different posts from different members
		Justice for Bhopal Gas Disaster victims	0	1	1	0	0	0	0	Only 2 members, explicitly states water contamination issues in about section
		JUSTICE FOR THE BHOPAL VICTIMS.	0	2	0	0	2	0	0	Only 1 member, long description in about section
		JUSTICE FOR THE BHOPAL VICTIMS.	1	2	1	1	1	2	2	Over 7,500 members, same description as above cause but more members and recruiting through members
		Bhopal Tragedy - Injustice to the Innocents	1	2	1	1	1	0	0	Only 2 members, post from administrator
		Justice for Bhopal Gas Tragedy Victims	0	1	0	0	1	0	0	Only 8 members, post from administrator
		Fight for justice for the Bhopal gas victims....	0	2	0	0	1	1	0	Over 170 members, indepth description in about section, few posts from others

Social Media Service	Data Point	Name and Link to Data Point	Archivist: identify, find, gather, collect	Librarian: categorize, tag, label, organize	Preservationist: store, maintain, copy, republish	Editor: filter, select, assess, verify	Story Maker: synthesize, provide context	Exhibitor: display, distribute, juxtapose	Docent: guide, discuss, mediate, reflect	Description of Curatorial Activity
Flickr	Groups	Lest we forget- Bhopal gas tragedy Flickr group	2	2	2	2	2	2	1	Only 64 items many of which were included based on admins request, some description for group and in some photos, not many comments or discussions
	Photo-stream	ICJB photostream	1	1	1	2	2	1	0	Some photos have a description, no comments, some had no titles
		an equilibrium always exists photostream	1	2	1	1	1	2	0	Artwork, paintings and sketches with a long caption that included summaries and links to websites on broad issues related to the artwork, comments not allowed
	Sets	Open Wounds: Bhopal 1984-2009	1	2	1	2	2	2	0	Professional photos of the Bhopal survivors and their environment, personal stories and descriptions for each photo, quite a few views but no comments
		B'Eau Pal Water	1	1	1	2	2	2	0	The description for each photo is the same and it juxtaposes the image and provides a historical background on Bhopal water, no comments or engagement
		Bhopal 25	1	1	1	2	2	2	1	Same description for each photo, juxtaposes with image, authoritative information based on user type, not much engagement from others, many viewed it
		Bhopal Portraits	1	2	1	2	2	1	1	Same description for each photo, juxtaposes with image, authoritative information based on user type, not much engagement from others, many viewed it
		Bhopal 25 years later	1	2	1	1	1	1	0	Photos are from photojournalists credited in caption, caption contains story, a few tags, no comments
		Bhopal Today	1	0	1	1	1	1	0	Short titles and caption, no tags, some juxtaposing titles with photos, no comments, no views
		Art for Bhopal- Water Pots	1	2	1	2	1	2	1	Photos of art some with in-depth descriptions of the reason for water pots, some have many tags, not many comments, not many views
		bhopal gas disaster: 25 years too late	1	2	2	2	2	2	2	Each photo has its own unique story, also appears in other groups, more comments and engagement by others, many tags and titles
	Photos	bhopal gas disaster 25 years and counting	2	2	2	2	2	2	2	Contains a story in the description with mention of source, many views and quite a few comments, photo appears in other groups
		Clean up Bhopal Now	2	2	2	2	1	2	1	The caption is personalized, many views and some favorites, most comments request the photo appear in other groups
		Born from Hell: Innocent Victims of a Chemical Legacy_hapu	1	2	2	1	2	1	0	Caption contains a story of the photo with tags, no comments, not in other groups, many views
		विष बाध	2	0	2	2	2	2	1	Artwork with a lengthy caption, no tags, a couple of comments, many views, juxtaposition in the art itself
		Bhopal gas Tragedy 20000 dead and counting	2	1	2	2	2	1	1	Story in caption, not many tags, comment from user, quite a few views, appears in one set
		Bhopal Medical Appeal Vigil 2	1	2	1	2	2	1	0	Caption contains history, many tags, some views, no comments, appears in one set
		BHOPAL	2	2	2	2	2	2	2	Caption is in Italian, many comments and views, appears in groups and sets, image appears in other places online, many tags, geotagged
		Union Carbide Gas Tragedy memorial, Bhopal	1	1	2	2	2	1	0	Long caption with text from Wikipedia, some tags, many views, no comments
		"Freedom is the art of human release."	2	1	2	1	1	2	0	Artwork, paintings and sketches with a long caption that included summaries and links to websites on broad issues related to the artwork, comments not allowed
		gallery-2-2	2	0	2	2	2	1	0	Photo and caption taken from Greenpeace, no tags, no comments
		IMG_3974.JPG	1	0	1	1	1	1	0	Photos for a TV program, not many tags, generic title, same caption for all Bhopal photos, no comments allowed, not many views
		IMG_3981.JPG	1	0	1	1	1	1	0	Photos for a TV program, not many tags, generic title, same caption for all Bhopal photos, no comments allowed, not many views
		IMG_3987.JPG	1	0	1	1	1	1	0	Photos for a TV program, not many tags, generic title, same caption for all Bhopal photos, no comments allowed, not many views
		DSC02192	1	0	1	1	1	1	0	Photos for a TV program, not many tags, generic title, same caption for all Bhopal photos, no comments allowed, not many views
		DSC02198	1	0	1	1	1	1	0	Photos for a TV program, not many tags, generic title, same caption for all Bhopal photos, no comments allowed, not many views
		Open Wounds: Bhopal 1984-2009	1	2	2	2	2	2	0	Photo has a story specific to the image, many tags, no comments
		Polly Morgan - 'Chemical Plant'	1	2	1	2	2	2	0	Photo of artwork that juxtaposes the story in caption, a lot of tags, no many views, a few favorites, no comments
		Bhopal Disaster 1984	2	0	2	1	1	2	0	Photos are from other sources but no credit of photo, no tags, no comments, short caption
		Futile, Red	1	0	1	1	1	0	0	Photo with short cpation, no tags, no views

Social Media Service	Data Point	Name and Link to Data Point	Archivist: identify, find, gather, collect	Librarian: categorize, tag, label, organize	Preservationist: store, maintain, copy, republish	Editor: filter, select, assess, verify	Story Maker: synthesize, provide context	Exhibitor: display, distribute, juxtapose	Docent: guide, discuss, mediate, reflect	Description of Curatorial Activity
Flickr	Photos	Children are reflected in groundwater, believed to be contaminated, near the site of the deserted Union Carbide factory in Bhopal, India, by Daniel Berehulak 2009	2	0	1	2	1	1	0	Long title that includes source, no tags, not many views, no comments
		8-yr-old Annan suffers from cerebral palsy – 25 years after the biggest industrial disaster in history, toxic material continues to affect the people of Bhopal, by Daniel Berehulak 2009	2	0	1	2	1	1	0	Long title that includes source, no tags, not many views, no comments
		Dow Chemical Co. took over Union Carbide in 2001 and claims it is not responsible for cleaning up the site of the 1984 Bhopal gas leak disaster, by Manish Swarup 2009	2	0	1	2	1	1	0	Long title that includes source, no tags, not many views, no comments
YouTube	Channels	bhopalbhopal	2	2	2	2	2	2	1	Many videos with caption if not in English, short description, accurate title, some tags, categorized, no comments, not many subscribers
		The Bhopal Medical Appeal	2	2	2	2	2	2	1	Many videos specific to second disasater in English, descriptions for each video, many tags, has friends and subscribers, not many comments
		WaterWideWeb.org	1	1	2	2	2	2	2	Two videos related to Bhopal appear on this Channel, this provides a broader understanding of water crises around the world, many subscribers a few comments
		toogoodius	2	1	2	2	2	1	0	This channel contains longer videos that help promote Bhopal Medical Appeal, long descriptions, many tags, no comments, no subscribers
		JusticeforBhopal	1	2	2	2	2	2	1	Two videos, 14 subscribers, 1 comment, favorites other videos
		ICJBinNYC	1	2	2	2	2	2	1	Only 4 videos and 5 subscribers but a lot of comments on some of the videos, a long caption with the story of Bhopal, some tags with informative titles
	Playlists	chernobyl and other disasters	2	2	2	2	2	1	0	A mashup of multiple industrial disasters, 46 videos, 227 views
		Chemicals	2	2	2	2	1	1	0	A mashup of videos related to chemical crises, 109 videos, 68 views
		07. Dow chemical Company	2	2	2	2	2	2	0	A mashup of videos related to Dow Chemical, 57 videos, 3,161 views
		It Happened In...	2	1	2	2	0	0	0	A mashup of videos related to disasters around the world, 29 videos, 9 views
		Environment	2	1	2	2	0	2	0	A mashup of videos related to environmental hazards, 151 videos, 453 views
		Crimes Against Humanity	2	1	2	2	1	1	0	A mashup of videos related to crimes against humanity, 200 videos, 231 views
	Videos	Remembering Bhopal gas Disaster 1984	2	2	2	1	2	2	2	Mashup of news clips, title and tags, caption in video mentions ongoing contamination, over 8,700 views, 15 comments
		Toxic Water-Bhopal's SECOND Disaster 3	1	2	2	2	2	0	0	The caption provides details on this second disaster, quite a few tags and includes a category, no speaking just ambient sounds and captions of the toxins in video, no comments and not many views, just one video mashup
		Bhopal 25 Years On	2	1	2	2	1	1	1	BBC news clip not uploaded by BBC, title and tags are not detailed, no caption, 200 views, 2 comments
		25 years on: Bhopal still contaminated	2	2	2	2	2	2	0	NDTV news clip, title and caption add info about contamination but the clip is about the disparity in compensation, comments disabled, over 1000 views
		Indians of Bhopal Protest Over U.S Union Carbide Industrial Toxic Poisoning	2	1	2	2	2	1	0	RT news clip uploaded by RT, contains long title, some tags, no comments, 25 views
		short documentary on bhopal gas tragedy-4/5	2	1	2	2	1	2	1	This is a short documentary that appears in other places, no description, some tags, a few comments, over 8,200 views
		Killer gas: Toxic legacy of World's worst industrial disaster in India	1	1	2	2	2	2	2	RT news clip uploaded by RT, contains long title, some tags, 19 comments, over 2000 views
		It happened in Bhopal - 27 Aug 07 - Part 2	1	2	2	2	2	2	2	AlJazeeraEnglish news clip, contains title and tags, over 50 comments and over 18,000 views
		Bhopal the endless tragedy	1	2	2	2	2	2	2	Documentary created by user, short caption, some tags, includes interviews with key stakeholders, 11 comments, over 13,000 views
		Bhopal Disaster - BBC - The Yes Men	2	2	2	2	2	2	2	One version of the BBC clip of the Yes Men, title and tags, 260 comments and over 180,000 views, this video appears in multiple playlists
		the yes men	2	2	2	2	2	2	2	Another version of the BBC clip of the Yes Men, title and tags are short, over 270 comments and over 439,000 views, this video appears in multiple playlists
		Union Carbide Kills 8,000 In One Day in Bhopal	1	1	2	2	1	2	1	BBC news clip not uploaded by BBC,contains title and caption, tags not broad enough, interviews with high official, 1800 views, 3 comments
		Interview - The Bhopal Disaster: 25 Years Later	2	2	2	2	2	2	1	Radio interview with stakeholders, contains caption and title but not specific, many tags, 5 comments, over 1,700 views
		BBC Interview with the Yes Men, Five Years On - Part I	2	2	2	2	2	2	1	BBC interview with Yes Men, contains caption and title, some tags, 6 comments, over 2,500 views
		The Bhopal Chemical Disaster: Twenty Years Without Justice	2	1	2	2	2	2	2	Documentary created by user with interviews with key stakeholders, 54 comments and over 37,000 views, brief caption, some tags
		The Curse of Bhopal - Tropic Of Cancer - Episode 4 Preview - BBC Two	1	2	2	2	2	2	1	BBC video clip links to photos shared on Flickr, contains caption and title, 10 comments and over 2,300 views
		no more bhopals.avi	2	1	2	1	2	2	0	Artistic video with a long caption at the end with story, contains long caption, few tags, 1 comment, over 400 views

YouTube	Videos	"B'EAU-PAL" WATER SCARES DOW EXECS INTO HIDING	✓	2	✓	2	✓	2	✓	2	✓	2	!	1	!	1	Video about the process of making the B'eau-Pal spoof water, explaining the juxtaposition, long caption, some tags, 1 comment, 230 views
		Bhopal: Locals oppose disposal of Carbide waste	✓	2	✓	2	✓	2	✓	2	✓	2	!	1	✗	0	NDTV news clip, title and caption provides info, some tags, comments disabled, 155 views
		We drink toxic water.mov	✓	2	✓	2	✓	2	✓	2	✓	2	!	1	!	1	Juxtaposition between images and caption, title and tags, 2 comments 99 views
		Hush Baby - Bhopal Continues to Suffer	✓	2	✓	2	✓	2	✓	2	✓	2	✓	2	✗	0	Mashup of images, like a lullaby with a poem like narration, caption, many tags, over 2,200 views, 1 comment
		Bhopal Torch Rally Dec. 2nd 2009	✓	2	✓	2	✓	2	✓	2	!	1	!	1	✗	0	Video contains "water contamination" as tag and in caption, video focuses on rally, 100 views, no comments
		Exclusive: A generation grapples with Bhopal gas tragedy	✓	2	✓	2	✓	2	✓	2	✓	2	✓	2	!	1	Video contains "water contamination" as tag and in caption, over 570 views, one comment with others marked as spam
		Collecting Water in Oria Bustee	✓	2	✓	2	✓	2	✓	2	✓	2	!	1	✗	0	Video contains "water contamination" as tag and in caption, video juxtaposes with caption which has long story, over 140 views, no comments
		Art For Bhopal - Skullduggerous.mov	!	1	✓	2	✓	2	✓	2	✓	2	✓	2	✗	0	Video advertising gallery with long caption explaining history, many tags, over 300 views, no comments
		Riding rickshaws at election time in Bhopal... going nowhere, fast!	!	1	✓	2	✓	2	✓	2	!	1	!	1	✗	0	Video contains "water contamination" as tag and in caption, video shows people in streets, 70 views, no comments
		The chemical waste fields Bhopal	✓	2	✓	2	✓	2	✓	2	✓	2	✓	2	✗	0	Video shows evidence of water contamination, explained in caption, no comments, over 1,300 views
		Sathyu Sarangi comments on official CES India contamination report 1/12/09	✓	2	✓	2	✓	2	✓	2	✓	2	!	1	✗	0	Explains a scientific report to prove contamination, link to report, short caption, few tags, only 46 views, no comments
		The Yes Men Fix The World, P2P Edition FULL MOVIE (2009) (HQ)	✓	2	✓	2	✓	2	✓	2	✓	2	✓	2	✓	2	Part of a longer documentary by the Yes Men, title and caption and tags do not mention bhopal, 49 comments, over 11,400 views
		Dominique La Pierre on Dow Chemicals 1/12/ 09.	✓	2	✓	2	✓	2	✓	2	!	1	!	1	✗	0	Video contains "water contamination" as tag, over 160 views, no comment
		Bhopal- India....The cost of Corporate neglect	✓	2	✓	2	✓	2	✓	2	✓	2	!	1	✗	0	Video from Bhopal Medical Appeal, copied and shared, no comments, 92 views, contains the same long description appears with story of contamination
		BMA Event Video- 'Bhopal's Second Disaster'	✓	2	✓	2	✓	2	✓	2	✓	2	!	1	✗	0	Video backdrop with a mashup of images and captions that mention water contamination, no comments, 26 views, relevant title, some tags
		Bhopal 26 Years Later - Search for Justice Continues	✓	2	✓	2	✓	2	✓	2	✓	2	✓	2	!	1	Video was shared widely on 26th anniversary, contains a short caption and few tags, over 4,200 views, 7 comments
		India-Bhopal Anniversary	✓	2	✓	2	✓	2	✓	2	✓	2	✓	2	!	1	VOA news clip, title and caption, 555 views, 1 comment

Social Media Service	Data Point	Name and Link to Data Point	Archivist: identify, find, gather, collect		Librarian: categorize, tag, label, organize		Preservationist: store, maintain, copy, republish		Editor: filter, select, assess, verify		Story Maker: synthesize, provide context		Exhibitor: display, distribute, juxtapose		Docent: guide, discuss, mediate, reflect		Description of Curatorial Activity
Twitter	September Tweets	Clean up India's ground zero, Dow Chemical! RT @BhopalMedAppeal: Water still a killer at #Bhopal... http://bit.ly/cmAPGC - @GMWatch	✓	2	✓	2	!	1	✓	2	✓	2	✓	2	✓	2	User RT @BhopalMedAppeal who identified a relevant link, and added more info, included multiple hashtags, provided a brief comment, coming from a known user, 10 RTs, authoritative source
		Bhopal water still toxic, 25 years on... http://fb.me/AxehroBz #Obama #Dow #Bhopal #BP - @BhopalMedAppeal	✓	2	✓	2	!	1	✓	2	✓	2	!	1	✗	0	User identified a relevant link, added some info for context, add hashtags, 1 RT, authoritative source
		Dow Liable for Bhopal Disaster... http://thomassroche.wordpress.com/2008/06/02/dow-liable-for-bhopal-disaster/ - @BhopalMedAppeal	✓	2	✗	0	!	1	✓	2	✓	2	!	1	✗	0	User identified a relevant link, brief title, no hashtags, 3 RTs, authoritative source
	October Tweets	15. Bhopal Water Still Toxic Twenty-five Years After Deadly Gas Leak http://dlvr.it/6MRjD - @infokubo	✓	2	✗	0	!	1	✓	2	✓	2	!	1	✗	0	Sharing a weblink, no hashtags, part of a larger list of articles
		After 25 Years, Bhopal Water Poison http://bit.ly/aWnU9y #water #eco #green #ecomonday #waterwednesday - @SuperWaterMan	✓	2	✓	2	!	1	✓	2	✓	2	!	1	✗	0	Sharing a weblink, 5 hashtags, connecting it to water issues
		On polluted open wells near Bhopal Bihar. Need to clean 'em up http://bit.ly/aEn8GP make 'em sanitary wells #groundwater #water @ahambhumika - @zenrainman	✓	2	✓	2	!	1	✓	2	✓	2	!	1	✗	0	Sharing a weblink, 2 hashtags focused on water, related issue
		Indian Govt confusion over Bhopal court cases? Water and gas disasters are SEPARATE ISSUES http://fb.me/MSaGHz5E - @BhopalMedAppeal	✓	2	✗	0	!	1	✓	2	✓	2	✓	2	✓	2	Sharing a weblink, clarifying that there are two separate disasters, authoritative source, asks a question
		I hate those Dow "human element" commercials because it's a giant lie, if they cared about people they'd clean up Bhopal, India. - @rynthetyn	✗	0	✗	0	✗	0	✗	0	✓	2	✓	2	✓	2	A comment about Dow, conversation and opinion oriented
		The Bhopal clean-up MUST be done properly http://fb.me/srij10Ar #Obama #Dow #Bhopal - @BhopalMedAppeal	✓	2	✓	2	!	1	✓	2	✓	2	!	1	✗	0	Sharing a weblink, a request, 3 hashtags, authoritative source
	November Tweets	Bhopal Water Contamination - Available on the Corbis website at http://tinyurl.com/32fov6k - @AlexMasiPhoto	✓	2	✗	0	!	1	✓	2	✓	2	!	1	✗	0	User promotes his own pictures at a website, no hashtags, 1 RT
		@BDUTT CBI has failed in 2 decades after bhopal. Should it be disbanded to cleanse it up. Please start a dscsn. I wish to be a part.`- @Shashi_99	✗	0	✗	0	✗	0	✗	0	✓	2	✗	0	✓	2	Request to start a discussion

Twitter	November Tweets	The children of Bhopal risk their lives by playing cricket on fields contaminated by a horrifying past	http://es.pn/aEqojh - @espncricinfo	2	0	1	0	2	2	0	Sharing a weblink to a video, 6 RTs
		Watch B'eauPal 'Advert' on Vimeo! http://vimeo.com/7990750 #Obama #Dow #Bhopal - @BhopalMedAppeal		2	2	1	2	1	1	0	Promoting a video that is a spoof, 3 hashtags, authoritative source
	December Tweets	Will India now participate in US law suit regarding Bhopal water contamination? - Bhopal - @BhopalMedAppeal		0	0	0	0	2	1	2	Poses a question, authoritative source
		15. Bhopal Water Still Toxic 25 Years After Gas Leak 16. Universal Jurisdication On Crimes Against Humanity Dies In Spain… - @Outellect		1	0	0	1	1	0	0	Mentions one of the articles related to Bhopal but does not provide weblink, the inclusion of the 16 article provides context
		#15. Bhopal Water Still Toxic Twenty-five Years After Deadly Gas Leak: http://wp.me/p13L0q-da - @PhxProdOnline		2	0	1	2	2	1	0	This one includes the weblink to this article 15, title shows ongoing nature
		@primary_red @alpeshtwitting @centerofright @gkhamba @greatbong @anandmahindra Dow chemical must clean up the Bhopal site.Plz RT Mak it trnd - @rushie82		0	0	0	0	1	0	2	Encourages a discussion by mentioning 6 people in tweet, request to RT and make it a trending topic in Twitter
		@BDUTT @bomanirani @BollywoodGandu @bhogleharsha @earth2angel @flyyoufools @GabbbarSingh Dow chemical must clean up the bhopal site. Plz RT. - @rushie82		0	0	0	0	1	0	2	Encourages a discussion by mentioning 7 people in tweet, request to RT and make it a trending topic in Twitter
		25th anniversary of the Bhopal disaster http://bit.ly/93m8Hq		2	0	1	2	1	2	0	A weblink to the Boston Big Picture photos of Bhopal, this weblink was appeared around 25 times
		Today is the 26th Anniversary of the Bhopal Disaster. Twenty-six years later, we are still storing tons of hazardous chemicals on-site in US - @nanopatents		0	0	1	1	2	2	0	A tweet that tries to relate the crisis to the US and chemical contamination issues, no sources, not specific
Wikipedia	Article and Discussion	Bhopal disaster		2	2	2	2	2	2	2	Main wikipedia page aggegates multiple sources of information and reorganizes in a way to tell the larger story, it does not preserve the references
		Dow Chemical Company		1	1	1	1	1	2	2	The article does not explicitly mention the water contamination and Dow's responsibility to take care of this, it only contains a very short section on Bhopal
		Union Carbide India Limited		1	1	1	1	1	1	1	This is a very short article but half of it talks about Bhopal and a brief mention of cleanup of the plant
		International Campaign for Justice in Bhopal		1	1	1	1	1	1	0	This article is somewhat short in an outline format, it does mention their mission to demand Dow to cleanup the site, no discussions
		International Medical Commission on Bhopal		2	2	2	2	2	1	0	This article is lengthy and compiles a lot of the work about this organization and mentions briefly the water contamination issue
		Sambhavna Trust		1	1	1	1	1	1	0	Briefly mentions the chemical pollution, provides more info about resources and related literature
		The Yes Men		2	2	2	1	2	2	2	There is a section on Dow Chemical and the need for cleanup, aggregates many sources about this hoax, provides a lengthy enough story on this
	Category	Category: Bhopal disaster		2	2	1	1	1	2	0	Includes the crisis, perpetrators, victims, advocacy organizations, authors; categorized by editors
		Category: Man-made disasters		1	2	1	1	1	2	0	Provides an overview of man-made disasters but only includes a select few

Analysis of Curatorial Activities for Bhopal Second Disaster Ongoing Meta-Narrative		Archivist: identify, find, gather, collect	Librarian: categorize, tag, label, organize	Preservationist: store, maintain, copy, republish	Editor: filter, select, assess, verify	Story Maker: synthesize, provide context	Exhibitor: display, distribute, juxtapose	Docent: guide, discuss, mediate, reflect	Summary of Analysis
TOTAL		200	190	198	210	217	189	99	Maximum of 272 if all are "2" and maximum of 136 if all are "1"
AVERAGE		1.47	1.40	1.46	1.54	1.60	1.39	0.73	Most curatorial activities have average presence, storymaking activities are the highest, docenting activities are the lowest
Analysis Based on Social Media Service	Facebook	1.26	1.85	1.26	1.07	1.48	1.26	1.19	Most curatorial activities have an average presence, librarian activities are highest, editorial activities are the lowest
	Flickr	1.36	1.03	1.39	1.64	1.52	1.42	0.39	Most curatorial activities have an average presence, editorial and storymaking activities are highest, docenting activities are the lowest
	YouTube	1.76	1.74	2.00	1.96	1.74	1.57	0.72	Most of the curatorial activities have a higher than average presence with preservation & editorial activities as the highest, docenting activites are lowest
	Twitter	1.35	0.60	0.70	1.30	1.75	1.10	0.70	Half of the curatorial activities have an average presence; but librarian, preservation, and docenting activities are the lowest
	Wikipedia	1.44	1.56	1.33	1.22	1.33	1.56	0.78	Most of the curatorial activities have an average presence, librarian and exhibition activities are the highest, docenting activities are the lowest

9.3.3 Critique of the Initial Conceptual Model of Curation

The initial conceptual model of curation provided a helpful way to isolate the different curatorial activities based on common cultural heritage professions. During the assessment of the model on the Bhopal meta-narrative, I began to realize the difficulties in interpreting the differences between some of the curatorial activities based on the data type. Therefore, it became evident that there were different types of activities associated with each of the seven curatorial activities I identified earlier. Different interpretations of these activities arose from the analysis. After the assessment, I found discrepancies in how I represented the idea of socially-distributed curation with my initial conceptual model of curation. I address these issues while developing the theoretical model of socially-distributed curation.

In the final theoretical model of socially-distributed curation, I decided to keep the basic structure of the initial model the same, but I adapted the model in three ways. First, I changed the archetypes into two primary activities, and then I moved the "preserve and maintain" activity to the top part of the model. Second, I developed in-depth descriptions of each curatorial activity to explain the different interpretations of each activity, which are presented in Section 10.5. Third, I developed another diagram of the model to depict the unique relationships between each curatorial activity, which is presented in Section 10.6.

While elucidating the definition of each curatorial activity, the relationships between each curatorial activity were evident. The arrows that appear in the initial model were intended to show the socially-distributed aspect of curation that I predicted was taking place in the social media landscape. For example, user1 may collect a set of artifacts and then user2 uses that collection to tell a story, while user3 adds tags to organize the collection. What I predicted was a distributed form of collaboration where different users would engage in different curatorial activities. After conducting a close assessment of the curatorial activities for the Bhopal "second

disaster" narrative and a broad analysis of the curatorial activities in the Bhopal and 9/11 narratives, I began to see a different set of relationships happening in practice. Certain curatorial activities exhibited a cyclical relationship while other curatorial activities only occurred after a certain curatorial activity was complete.

Although I considered reshaping the model to make certain activities larger than others, I decided that each curatorial activity plays an important role in making curation successful even though some activities may exist all the time while others may not be supported very well. Instead, I use different types of arrows to indicate the relationships between the activities as a way of communicating the complex interpretations of how socially-distributed curation happens in practice. The final theoretical model of socially-distributed curation depicts what is happening in practice but I allude to what could be better supported with technical tools.

9.4 Theoretical Model of Socially-Distributed Curation

After developing an initial conceptual model of curation based on how people define curation and assessing this model based on a particular crisis meta-narrative, I produced a theoretical model I call *socially-distributed curation*. This section contains three subsections that unpack the meaning of socially-distributed curation: Section 9.4.1 explains each of the seven curatorial activities based on what occurs in practice. Section 9.4.2 explains the socially-distributed relationships between these activities. Section 9.4.3 presents the final theoretical model of socially-distributed curation. The purpose of developing this theoretical model is to explain the meaning of each activity associated with the concept of curation as well as to clarify the relationships between these activities, since curation has become a complex and ambiguous term. This theoretical model draws from the way people interpret the concept of curation (as

discussed in Sections 9.1 and 9.2) and the analysis of actual curatorial activities that happen in practice in the social media landscape (as discussed in Section 9.3).

9.4.1 The Seven Curatorial Activities

The concept of curation involves multiple activities that need to be unpacked. The initial conceptual model of curation (see Section 9.3.1) is based on seven archetypes to distill the primary duties associated with curators. The revised theoretical model shifts the focus away from curatorial roles and more towards the following seven activities or actions involved with curating in the social media landscape:

1. Preserve and maintain
2. Collect and archive
3. Categorize and organize
4. Edit and verify
5. Craft story and synthesize
6. Exhibit and juxtapose
7. Guide and converse

The following seven subsections explain each of these activities in more detail. They include findings from the assessment of curatorial activities for the Bhopal "second disaster" meta-narrative as well as excerpts from my interviewees and social media artifacts as further illustrations each curatorial activity.

9.4.1.1 Preserve and Maintain

One of the overarching purposes of curation is to preserve and care for an artifact in order to maintain its longevity. As mentioned in Chapter 2, heritage can be tangible or intangible. This dissertation focuses on the memories that produced narratives and the messages that emerged from these narratives. A memory can be viewed as both tangible and intangible. If the goal is to preserve the memory, one must recognize the difference between preserving the tangible

medium in which the memory exists and preserving the information contained within the memory regardless of the medium in which it was transmitted.

Based on the assessment of the curatorial activities for the Bhopal "second disaster" meta-narrative, YouTube scored the highest in preserving this memory because the videos and the descriptions for each of these videos mention the ongoing water contamination issue in Bhopal. Twitter scored the lowest in preserving this memory because my criteria for preservationist activities were different. A tweet that contained a link received a "1" because it was only a link and not a copy of the actual artifact that discussed this water contamination issue. A tweet that did not contain a link received a "0." After developing this theoretical model, I now consider these tweets that clearly state the water contamination issue as a way of preserving the memory of the "second disaster" in Bhopal.

What emerges in the social media landscape is the preservation of both types, depending on the kind of media being used to communicate and pass down this memory. For example, the most viewed YouTube video pertaining to the 9/11 attacks titled *9/11: Total Proof That Bombs Were Planted In the Buildings!* contains a mash up of news clips from the mainstream media that document firefighters, police officers, reporters, and other eyewitnesses claiming they heard bombs and secondary explosions. Preserving these news clips made these eyewitness reports more credible, which helped to strengthen the preservation of the memory that the World Trade Center Twin Towers and Building 7 might have collapsed due to explosives rather than the structural fires. The preservation of this memory has allowed 9/11 Truthers to pass on the message that this memory is proof of the explosive demolition hypothesis regarding the WTC collapses. Therefore, certain types of memory require the preservation of this medium in which it was recorded to strengthen the meaning and value of the message being passed down.

However, in the social media landscape, the preservation of the information contained within the memory is typically foregrounded, while leaving the medium partly preserved. In the context of memories that appear in web artifacts, preserving the original medium (e.g., the website or the web service) may be unnecessary, difficult, or impossible. Social media users tend to preserve these digital memories by reproducing the text of the memory, taking screenshots of it, or providing a link to the memory instead of saving the webpage or reproducing the web service to view the artifact, which is probably not legally permissible. Therefore, the preservation of memories in the context of the web is taking on new meanings in new forms.

Preservation in the web context is a distributed process and digital content has shown to be infinitely reproducible. Ensuring the long-term maintenance and storage of a memory via the web places propagation of the memory in the foreground and preservation of the original medium in the background. In other words, sharing a copy of the memory widely through a network can make it viral and ensure the preservation of the memory in the online world. It may sometimes be important to preserve the medium in which the memory exists (e.g., preserving a video by preserving it in a video format), but it becomes less important to preserve the original version in the digital age after it has been copied and shared. Tom Scheinfeldt, the Managing Director of the Center for History and New Media who oversaw the development of *The September 11 Digital Archive*, stated in an interview:

> *"There is no such thing as a digital original. There is absolutely no difference between the copy and the original. You can't really talk about preserving the thing because there is no one thing. There are instances of a copy of the thing. Those are hard notions for traditional curators who preserve the only version of an object…Sharing as part of curation seems kind of counterintuitive. The normal notion of curation is holding on to it, you are the steward of this object and you keep it close. In the web world, your job is to spread it around. That is a little weird for traditional curators."*

Therefore, openly sharing these memories is a critical component to keeping it alive. Social media is predominately about sharing memories with one's online network. Yet, information sharing is also built into the design of the web.

The web has become the prime medium for information sharing and storage as a new form of preservation, but having a web presence can be more transient than the presence of paper or microfiche. Still, some would argue that a web presence visible to Google is critical to maintaining its existence. As Anonymous Coward/MORTAR_COMBAT famously states, "In Googlis non est, ergo non est. (If it is not on Google, it does not exist.)." Some have even stated, "Google is the ultimate curator." What this suggests is that popular web services, whether it be Google or social media services like Facebook and Twitter, are becoming powerful mechanisms that give people the impression and illusion that what appears in their search results or in their web service are the only memories worth remembering. However, the web is only one window into the living heritage of current society.

The 9/11 Truth movement has relied on this form of preservation that exists on the Internet to ensure that the memories they use to legitimate their claims stay alive. For example, Nate Schoman, one of the administrators for *The 9/11 Truth Movement* Facebook cause, stated in a phone interview:

> *"With the Internet, people videotaped the news on 9/11. It got archived and then distributed and hosted in several locations. This enabled our ability to preserve 9/11-related information and defend it. The Internet preserved it so that it could not be destroyed, since it was replicated thousands of times over the Internet so that could not be erased, which proved to be invaluable. There was extensive work done by news agencies that tried to destroy these videos of reporters talking to eyewitnesses of the 9/11 attacks, but now these videos are immortalized on the Internet. People will forever be able to go back and review these videos without having to go through a media corporation to get it. The preservation of information is built into the Internet as information gets circulated, duplicated, quoted, reworked, and formed elsewhere. You can't make it disappear; it can't be erased. This archival aspect is the important part. As a 9/11 Truther, we are*

> *working to preserve the truth of what happened that day; that's the essence of the movement, and we are fighting against a title wave of opposition of the status quo and the media are all conspiring to squash this memory. We are dedicated to not have this story be misrepresented. It is a lifelong pursuit."*

9/11 Truthers took it upon themselves to take care of and preserve the eyewitness accounts and other 9/11-related memories by redistributing them through social media channels. These memories now saturate the web in multiple media formats.

Ultimately, an important aspect of preservation is identifying what needs to be kept alive and how to maintain it over time. Deciding what needs to taken care of in relation to what one cares about informs whether the message, the medium, or both need to be preserved. The challenge in the social media landscape is how to preserve social media artifacts. People are using social media to preserve artifacts from traditional media (e.g., scanning a newspaper and uploading it to Flickr, recording a TV news clip and uploading it to YouTube, etc.) in part because people now have the tools to easily do this. But how can social media artifacts be preserved? Is it necessary to preserve the entire social media service itself to be able to preserve these artifacts? Is there value in doing so? Or is a screenshot of a Facebook wall post or the text of a tweet from Twitter sufficient? What may presumably be forgotten if the medium itself is not preserved are the social principles and practices that have emerged from the design and use of social media. When preserving a sociotechnical phenomenon, there is a need to consider what it means to preserve the medium and the message. There may be value in maintaining the technical design and social principles that produced the sociotechnical phenomenon in order to, for example, have the ability to view the artifacts in its original environment or to ensure that the sociotechnical system continues to exist in current society. However, if the goal is just to preserve a message that can be adapted to any medium, then preserving a specialized medium may not be necessary.

9.4.1.2 Collect and Archive

Another important aspect of curation is building a collection through archiving techniques. Archiving involves deciding where to store them as collections. In the case of popular social media services, one might consider Flickr or YouTube as a collection site and search results on a particular keyword as a topic-specific collection incidentally gathered based on searching metadata. Facebook groups and blogs may also be considered sites that aggregate artifacts into a collection. What I argue later in Section 10.5.1.6 is that the social media services themselves are also exhibiting platforms. Thus, collections and exhibitions may be interchangeable when they allow open contributions.

Based on the assessment of the curatorial activities for the Bhopal "second disaster" meta-narrative, YouTube scored the highest in collecting and archiving because many of the channels, playlists, and videos were relevant and credible, since they were largely mainstream news reports and clips from professional documentary films on Bhopal that specifically mention the water contamination issue. Facebook scored the lowest in part because many of these Facebook groups, pages, and causes were not active and only provided relevant information in the description section.

Archiving also involves identifying trusted sources or popular sites of convergence and gathering a representative sample of artifacts from these sources and sites. In the immediate aftermath of the 9/11 attacks, more democratic forms of archiving emerged even outside the context of the web. For example, *Here Is New York* began at a storefront that allowed "anyone and everyone" to contribute to this unique exhibition, which is why it was subtitled, "a

democracy of photographs." In the following excerpt from the introduction to the book version of *Here Is New York*, Michael Shulan[253] explains the process of collecting images related to 9/11:

> *"This book contains nearly a thousand of the more than five thousand pictures that some three thousand photographers submitted to the exhibition. It has not been edited to showcase the 'best' or the 'strongest' images, but to give the most coherent sense of the whole. The guiding principle of here is new york is a simple one. If one photograph tells* a *story, thousands of photographs tell not only thousands of stories but also perhaps begin to tell* the *story if they are allowed to speak for themselves, to each other, and to the viewer directly, unframed either by glass, metal or wood, or by preconception or editorial comment. In the political sphere it is this principle, after all, which America's Founding Fathers advanced when they developed the notion of democracy—that wisdom lies not in the vision and will of any one individual, or small group of individuals, but in the collective vision of us all."*

Schulan draws attention to the importance of maintaining the rawness of each contribution by literally not framing the photos to value its unedited nature and allowing for multiple interpretations. *Here Is New* York was also the precursor to Flickr that provided a glimpse into the power of creating collections by and not just for the masses. All perspectives were appreciated and treated as of potential value to others who also were trying to make sense of the significance of 9/11.

In the case of the *Complete 9/11 Timeline* at the History Commons site, the process of contributing to the timeline involved a three-step review process before it would be publicly accessible. Granted that this timeline was largely based on Paul Thompson's research, the timeline as a whole provides a much broader collection of sources and artifacts on terrorism pertaining to 9/11 than any other 9/11 collection. Mike Tuck, one of the managers of this timeline, points out:

> *"We try to give enough viewpoints and different sources to get some aggregate picture to form the reality of the situation. We are strong in the 9/11 timeline and the Iraq Invasion timeline, where you can see the underlying reason of the Iraq invasion. If we draw from enough sources, we can start to paint a complete*

[253] http://hereisnewyork.org/about/democracy.asp

> *picture. Each source is like a color, where we are giving you the palette and the user creates its own painting. We try to combine as many different types of information resources as possible. When you take it in as an aggregate, it gets closer to the truth, but it is still open to interpretation."*

In other words, temporally aggregating thousands of content that exist in multiple channels can be very powerful and meaningful because each artifact exists in the context of thousands of other artifacts. While the *Here Is New York* exhibition exemplifies the power of having thousands of individuals contributing their own content, the *Complete 9/11 Timeline* demonstrates the power of just gathering thousands of content from multiple sources to obtain a representative sample of the perceived reality.

Regardless of the form in which these collections exist, the act of archiving also involves maintaining the collection by keeping it current and up-to-date. Administrators of social media groups typically post new content on a regular basis as a manual way to show that these groups are consistently updated. Yet, social media services have also used algorithms to automatically collate the "most recent" content uploaded to their site. Having the ability to display the content based on the most recent upload is another way to show that their social media service is constantly being updated with new content. With sociotechnical phenomena, there is likely to be a mix of human and algorithmic aggregation happening at multiple levels. A user may use Google Search to look for relevant news articles but decisions are still made regarding what to share in a Facebook group or in a History Commons timeline. There is always an element filtering when building and maintaining collections.

9.4.1.3 Categorize and Organize

Categorizing and organizing items in a collection are also important maintenance activities associated with curation. This involves creating the metadata of each artifact in the collection. Generally, the metadata for the social media artifacts were manually created. People

generated their own titles, created folksonomic tags, and chose a category based on a taxonomic classification system required by the social media service. In some instances, people used these metadata fields as a place to preserve the memory rather than it be in the artifact itself. For example, some Flickr photos included a long caption that often provided more information about the memory than the photo itself. Some Facebook groups included very long descriptions on the Info page, which were sometimes a duplication of a news article or a blog post about the Bhopal disaster. Search algorithms within social media services tend to search for keywords in these descriptions; therefore, creating tags may not always be the only way in which to find and categorize an artifact. Some web services are beginning to use natural language processing techniques to automatically suggest tags to associate with an artifact. Visual processing of photos and videos may also be needed in the future to extract metadata from multimedia artifacts.

Based on the assessment of the curatorial activities for the Bhopal "second disaster" meta-narrative, Facebook scored the highest in categorizing and organizing because many of the Facebook groups, pages, and causes contained extensive details about the water contamination issue in its title and description. This allows multiple groups, pages, and causes to appear in the Facebook search results even though there may not be a lot of activity within these Facebook groupings. Twitter scored the lowest in organizing and categorizing since hashtags were not frequently used in tweets related to the Bhopal disaster. This water contamination issue also did not generate its own hashtag, thus making this disaster less visible than the Bhopal gas leak.

The purpose of classifying the artifacts in the collection is that these catalog systems make it easier to search and find content. In Wikipedia, there are features that allow users to manually categorize an article in the context of other Wikipedia articles using broad themes, but I also view the creation of section headings within each Wikipedia article and the hyperlinks to

other Wikipedia articles as activities associated with organizing and classifying. In the current version of the Bhopal disaster Wikipedia article as of September 2010, the disclaimer that appears on the top of this article states, "This article may be too long to read and navigate comfortably. Please consider splitting content into sub-articles and using this article for a summary of the key points of the subject. (July 2010)." Ingrid Eckerman, Wikipedia editor that made the most contributions to the *Bhopal disaster* Wikipedia article, stated in an email interview:

> *"For a long time, it was suggested that the article should be divided in several shorter articles. But I looked at the text and could not make up how to divide it. Also, people are still asking questions and requesting for more details, so there is a tendency that the article will become longer and longer, just like the list of references…Everything belongs together, in a long chain from the green revolution to now. Actually, it is this chain I tried to show in my book and also on Wikipedia. You need the history to understand today. (I think one should always study history this way – from today going backwards, to understand why it looks like it does today.) [In other words,] to understand today, you need to know the history."*

Eckerman points to the interrelated issues and events that relate to the Bhopal disaster, as with many disasters. Splitting up the main Wikipedia article into sub-articles may make a very long article shorter and cleaner, but it requires the viewer to read multiple sub-articles in another window outside the context of the main article.

History Commons takes a different approach in that each event or entity in the timeline can be grouped together and linked to each other in multiple ways. This site states:

> *"Because of the excellent possibilities to tag entities and to group them in timetables, people can easily read and filter information, which is usually presented out of context. The History Commons is a project which helps connect the dots and sheds light on several inconsistencies in official narratives of some of the most important stories of our time."*

Unlike Wikipedia's model of creating multiple sub-articles within the main-article, History Commons allows users to group each entity in multiple categories through a temporal

reorganization of the events based on a category. One of the Project Managers of the *Complete 9/11 Timeline* explained in an email interview how his role as a manager facilitates the creation of these categories and linked entities:

> *"I am also what we call a 'manager' of the timeline, which means I get to participate in decisions about which categories the timeline has on its front page, as well as a couple of other minor things. However, it would be great to be able to, on a timeline front page, have not only meta-categories (such as Day of 9/11) and categories (like Flight AA 11), but also what you could call third-order categories (theoretically stuff like Military Response to Flight AA 11)."*

Although folksonomic tags allow users the freedom to associate any keywords to an artifact, they are non-hierarchical classification systems, which make it harder to understand the relationships between the keywords. History Commons allows Project Managers the ability to group the entities into multiple overlapping categories. However, what this manager points out is the need for even more specific labeling of sub-categories within each category to make it easier for viewers to browse and find information within the article.

Organization activities by subject matter experts are likely to produce better tags and categories that communicate the historical context of the artifact. Still, tagging and categorizing can be a tedious activity and potentially unnecessary if web services and search engines automatically index web artifacts and harvest the metadata as well as include analytics from algorithms like PageRank. It is also worth recognizing that categorizing and adding metadata also involves providing information about the creator of the artifact and additional information to credit the creator and provide the credentials needed to legitimate the inclusion of the artifact into the collection.

9.4.1.4 Edit and Verify

The adoption of the term curation in the social media landscape placed particular emphasis on editorial activities and being able to verify the artifacts that are included in the collection. To some extent, this reflects the relationship between journalism and history in terms of how news articles have come to shape history and how the editorial practice of journalists is one way in which to curate history. One way to talk about this is how curation involves assigning editorial weight by applying one's subject matter expertise when deciding what to include in a collection and what is of value and of cultural importance.

Based on the assessment of the curatorial activities for the Bhopal "second disaster" meta-narrative, YouTube scored the highest in *editing and verifying* because there was a high signal to noise ratio and the channels, playlists, and videos typically contained credible information largely from mainstream news reports and clips from professional documentary films, which tend to be perceived as reputable sources.

To support the editorial function, some social media services contained a strict authentication and appraisal process, while others were more open and relied on self-policing to ensure quality. Although quality concerns typically arise when including user-generated content created by an "amateur" that may not have the credentials of being a subject matter expert, much of the content shared in the social media service for these historic crises tend to reference content generated by mainstream media. Therefore, it becomes essential for contributors to verify and authenticate the content that they chose to include in their collections to gain trust in those using these collections.

Trusted sources may include content from traditional media outlets as well as scientific reports. Raw and unfiltered content from the average citizen were not as frequently shared unless

if they were eyewitness reports (such as the plethora of amateur videos capturing the WTC attacks), and even then an aggregation of eyewitness reports is likely to be more credible than just a single report. However, during more recent crises, there is evidence that members of the public who are directly affected by the crisis can be seen as ad hoc experts and stakeholders. In some ways, mainstream media outlets increasingly rely on them to provide critical information at a time when information dearth occurs during the emergency period. In addition, people relied on their friends to act as filters, since they tended to only share information that seemed not only personally meaningful but also worthy of sharing to others.

What is rather intriguing about most of the content shared in History Commons, Facebook groups, Wikipedia articles, and blog posts is that they are predominately links to mainstream news reports and articles. In the case of the History Commons site and the 9/11 Truthers, they complain about the controlled, filtered, and corporate-driven aspects of mainstream media but frequently use content from mainstream media to legitimate some of their claims. The value of using artifacts generated by mainstream media or at least traditional media is that most people tend to trust these sources (especially reports from investigative journalists), and using these sources makes their claims more credible. Therefore, the problem was not entirely that the mainstream news only reported the official story because these news outlets actually contain a wealth of material that now appear in the timelines and are used by 9/11 truthers. The problem was that these articles never made headline news and these media outlets limited the way in which they framed the significance of these narratives. Instead, what occurs in the social media landscape is the reposting of news articles with a new framing of what these narratives mean and why these narratives need to be preserved and not forgotten.

Although some users just posted links to original news articles, others directly copied and pasted the text of the article into social media, whether it is as a blog post, the caption of a Flickr photo, or as part of the description of a Facebook group. Therefore, ethical and legal issues need to be attended to regarding the use of copyrighted material and appropriately crediting the owner of the material. Generally, social media users claim that the way in which they repost copyrighted material is considered "fair use." For example, on the *Patriots Question 9/11* website, it included the following fair use notice:

> *"This website contains copyrighted material, the use of which has not always been specifically authorized by the copyright owner. This material is being made available in an effort to advance understanding of issues and facts related to and in some cases contradictory to the official account of the events of 9/11. This constitutes a 'fair use' of such copyrighted material as provided for in section 107 of the US Copyright Law. In accordance with Title 17 U.S.C. Section 107, the material on this site is distributed to those who have expressed a prior interest in receiving the information for research and educational purposes. If you wish to use copyrighted material from this site for purposes of your own that go beyond 'fair use', you must obtain permission from the original copyright owner."*

Although the creator of this website explicitly states his reason for reposting this copyright material, there are many other examples of social media content that contain copyrighted material but do not include the purpose for reusing copyrighted material. One aspect of mashing up and remixing copyrighted material, such as TV news clips, is that it helps to preserve this text in a new format. In some respects, these remixes of copyrighted material shared on YouTube may be considered "fair use" for research and educational purposes since it is not explicitly being used for commercial purposes. Instead, what may be gained is social capital, which indirectly may lead to financial gain but more importantly increases a person's online influence and reputation.

Another issue that is important to consider in the editing function of curation is the credentialing practices in collaborative editing environments, which is one major difference

between Wikipedia and History Commons. Wikipedia uses the MediaWiki software, which records who made what edits. This can facilitate verification and give credit to each editor using analytics from the back-end history. On the other hand, History Commons does not give credit to each contribution because they decided it was a "cooperative venture" making all the contributions "faceless now." The following excerpt[254] explains how History Commons differentiates itself from Wikipedia:

> *"Here is another area in which HC does not display the problems associated with Wikipedia—the anonymous, partisan edit. Wikipedia has secondary, after-the-fact peer reviews; contributors make whatever changes they like that appear instantly, and peers come behind them and make changes if needed. On controversial issues, events, or persons, this can and does quickly degenerate into a back-and-forth conflict, with users making unacceptable changes, Wikipedia personnel undoing changes, and so on, over and over again, until the page is locked down or restricted. This does not serve the user's best interests. Everything we publish goes through a peer review process with at least three people reading and reviewing the material before users see it."*

The following excerpt explains the three-step peer-review process in History Commons (HC):

> *"There are three steps to the review process. After an entry is submitted, it is reviewed for content to ensure that it is well-written and well-sourced. Sources are checked to ensure that what is in the entry accurately reflects the source material without resorting to plagiarism. An entry approved for content is then submitted for copyediting, using the HC style manual as a guide. If the event is rejected during the first step, it is sent back to the user, who reads over the comments and then resubmits the entry. If it is approved, another user, who is in charge of managing the user-defined timeline that the event was submitted to, then makes a decision whether or not the verified event should be added to the timeline. Each event is thoroughly reviewed for accuracy and proper grammar and spelling."*

In a phone interview, Mike Tuck—one of the managers and reviewers of History Commons—explains how they have at least three reviewers or gatekeepers in this process, but since it is a small group, they know each other's weaknesses and are able to provide a more balanced review

[254] http://historycommons.wordpress.com/conceptual-summary-of-project

process. The value of History Commons is that the editors know each other and sometimes become familiar with each contributor's background and expertise.

On the other hand, Wikipedia allows anonymous edits, but the MediaWiki software records each anonymous edit with an IP address. This IP address proved to be invaluable when Virgil Griffith built a software tool called Wikipedia Scanner. Phillip Coppens[255] explains in the following excerpt from a blog post who some of the Wikipedia editors are in relation to edits regarding the Bhopal disaster and the 9/11 attacks:

> *"Equally interesting is that a computer traced to American Airlines (AA) was used to make a significant change about 9/11. The original entry read: 'Two American Airlines aircraft were hijacked and crashed during the September 11, 2001 Terrorist Attack: American Airlines Flight 77 (a Boeing 757) and American Airlines Flight 11 (a Boeing 767)' – to which an AA employee added (somewhat ungrammatically): 'Although these flights were daily departures before and a month after September 11, 2001. Neither flight 11 nor 77 were scheduled on September 11, 2001. The records kept by the Bureau of Transportation Statistics do not list either flight that day.'...But WikiScanner especially revealed that most abuse originates from corporate clients—and politicians…Also uncovered by WikiScanner was that a computer registered to the Dow Chemical Company deleted a section on the 1984 Bhopal chemical disaster (which ultimately killed up to 22,000 people) which occurred at a plant operated by Union Carbide, now a wholly owned subsidiary of Dow."*

The collaborative editing structure of wiki technology allows anyone to participate in the editing process. There are tradeoffs to allowing edits to be semi-anonymous, since associating IP addresses to anonymous edits does not make the edit faceless. Being able to document who certain editors are and whether or not there is a deliberate attempt to have certain types of information remembered or, in this case, forgotten or misrepresented, can be a critical part of understanding who is curating our history by editing the living heritage in the digital world and deciding what parts of history should be remembered.

[255] http://www.philipcoppens.com/wikiworld.html

One final aspect of the editorial function of curation is that it requires filtering skills and mechanisms. In some ways, this filtering function may be similar to the process of deciding what to gather and include in the collection, as discussed in Section 10.5.1.2. One difference is that filtering for collection purposes involves finding trusted sources or content streams while removing irrelevant, misleading, or erroneous content like spam. Therefore, the first-order filtering focuses more on refining the stream of content included in the collection and fixing the filter to ensure a high signal to noise ratio. The second-order filtering that occurs at the editorial level involves selecting particular artifacts to include in the story to display in an exhibition. In the context of social media, this may mean selecting a set of artifacts to discuss in a blog post or a YouTube video. Still, both types of filtering involves making careful decisions about what to include based on what is relevant, reliable, and valuable and choosing artifacts that represent multiple perspectives.

9.4.1.5 Synthesize and Craft a Story

After selecting a set of artifacts from the collection, the next type of curatorial activity involves synthesizing the information from each artifact to craft a story. Crafting a story involves weaving together the artifacts and packaging them in a way that offers a key message. Stories are an important part of cultural memory and living heritage. They have the ability to safeguard memories and connect people to a distant past that has relevance to the present by making history become timeless. It is through stories that allow us to remember and understand history so that the lessons of the past become lessons learned in the present. Therefore, creating stories is critical for making sense of traumatic situations that arise from historic crises. The key to making and then telling a good story is that it must be evocative enough to awaken people to the actions that need to be taken to sustain a certain culture.

Based on the assessment of the curatorial activities for the Bhopal "second disaster" meta-narrative, Twitter scored the highest in synthesizing because the restriction of 140 characters was an enabler to making Twitter users synthesize their information and their main message in the size of a tweet. However, it is difficult to say how well Twitter users are crafting a story but some might argue that it is a "distributed story stream." Wikipedia scored low in synthesizing and crafting a story partly because the other Wikipedia articles related to Bhopal that were included in the assessment did not mention the second disaster and thus were not places where this memory was kept alive.

If one considers stories as narratives, then what I presented in the previous two chapters were a spectrum of macro and micro stories. The Bhopal chapter tells a substantial portion of the macro story of the Bhopal disaster. The five meta-narratives within it are smaller stories organized into different themes that make up the macro story of Bhopal. Within each meta-narrative, there are micro stories that each have their own message, including one that points to the ongoing aspect of the crisis in Bhopal with the "second disaster" regarding water contamination issues. Therefore, the previous two chapters present the multi-layer stories or narratives that I was able to extract from the social media landscape. This multi-layer depiction of the crisis narratives parallels with Debosmita Nandy's reflection of the Bhopal disaster in the following excerpt that appears in her blog post[256] titled *Bhopal Verdict: A Nation Held Guilty*:

> *"The story of Bhopal is full of horrors with multi-dimensional layers. At one layer is the causal reason behind the disaster, a multinational's disregard for the life and safety of people, wide-spread devastations caused and the attempt to compensate for it with handful of money. At another layer is the toxic waste produced, which no one, not even the present owner, Dow Chemical is willing to clear up and which contaminates the surrounding even today. Yet, another layer is the torturous legal battle culminating in last week's mockery of justice, subversion of judiciary in the face of politics. In the end, all these layers build up*

[256] http://debosmita.wordpress.com/2010/06/28/cover-story

> *the story of a mass murder perpetrated by a multinational corporation, with the aid of the home state."*

It is without a doubt that crises have multiple dimensions to its story and that there are many different ways in which to frame each dimension. The meta-narratives presented in this dissertation were intended to show how each crisis is a social process, as opposed to a single demarcated event, that still has stories being revised to keep its heritage alive.

Story making in the social media landscape is a distributed process. The components of such a story are typically from multiple sources and streams of content available online and offline. The story may also appear in distributed places across the social media landscape. For example, the sections that appear in a Wikipedia article; the categories contained in a History Commons timeline; the folksonomic tags of a Flickr photo, YouTube video, and blog post; and the titles of Facebook groups are some examples of the main themes that make up the story of a particular phenomenon like a historic crisis. What occurs in some social media services is the formation of a story collectively created by many contributors, such as Wikipedia articles.

Yet, sometimes the synthesis of a story appears in a particular location within each social media service. For example, individual users provided their own extensive interpretation and synthesis regarding the crisis in the caption of a Flickr photo, the description of a YouTube video, or the description of a Facebook group. For example, the description of the *9/11: Total Proof That Bombs Were Planted In the Buildings!* YouTube video provides a summary of the video and explains why the debunkers of 9/11 conspiracy theories make an incorrect claim that the WTC buildings collapsed due to exploding gas lines. What the YouTube user argues in his YouTube video description is that these Class-A buildings are not allowed to have gas lines to comply with safety regulations; therefore, gas lines could not have been the cause of the collapse. This user takes advantage of the title and description features of the YouTube video—

which are metadata fields that are indexed by search engines like Google—to ensure that his version of the story is easily remembered through his evocative message.

Social media services are also beginning to automate some aspects of the story making process. Single artifacts—like a link to a news article shared as a wall post in a Facebook group—may include a synthesis on the part of the user sharing the link. Typically, users would share the link without adding any additional information in their wall post. Instead of just showing the URL with a hyperlink to the article, Facebook automatically produces a short snippet of the text in the article, typically the first text line of an article (Figure 63) or the description that appears for a YouTube video. However, some Facebook users make the effort to either copy and paste additional information about the link created by someone else or provide his or her own reflections and interpretations of the information that appears in the linked artifact. This additional synthesis on the part of the user is often a step towards offering a message to the readers of the wall post of what is worth remembering.

Figure 63: Automated Summary Generated from Sharing a Link in a Facebook Wall Post

Another important aspect of making a story is providing context and explanatory text. This requires the story maker to make sense of and recognize patterns in the story to extract key points and offer them as messages to the viewer. Providing context can occur in at least two

ways, spatially or temporally. In my previous research on crisis map mashups, I investigated the new mapping practices around spatiotemporal interfaces particularly during the emergency period of a crisis (Liu and Palen, 2010). In addition to map mashups, geotagging is also an emerging practice that will likely provide a wealth of information and lead to innovative practices of sharing contextualized data, but currently this is not a well-supported practice yet for heritage matters.

A common theme that emerged in this research was the organization of information and stories in temporal ways. Timelines are one approach to conveying historical context. Social media services, like Facebook and blogs, enforce a temporal way of organizing information with an emphasis on the most recent post through its reverse chronological order interface. History Commons is a service that offers users the ability to present collections and stories primarily through a temporal interface in addition to the editor's high-level categories. However, there mission and the features on their site do not allow contributors to offer key insights explicitly through the project timeline page. There is a Forum section on the History Commons site but this facilitates discussions (which is discussed in Section 10.5.1.7) rather than key analytical findings and messages. This is why the current version of History Commons is more like a "commons" by being a public collection, rather than allowing contributors and visitors to create their own sub-timelines and offer findings of common patterns that appear in the timeline. However, the future plans of History Commons are to create develop these social features for the timelines.

In the case of Bhopal, the ongoing battle for justice by Bhopal survivors has warranted the use of timelines to depict their ongoing struggles. For example, in a blog post titled *Bhopal gas tragedy and investigation – Complete Report – Reality Views*, sm[257] created an extensive

[257] http://realityviews.blogspot.com/2010/06/bhopal-gas-tragedy-and-investigation.html

chronological report detailing significant events related to the Bhopal gas tragedy. At the end of his blog post, he presents a series of conclusions labeled "Reality Views by sm," which are the takeaway messages that explain the importance of remembering the Bhopal tragedy in relation to present day concerns. The following is sm's synthesis of the legal battles that occurred in the aftermath of the Bhopal gas leak and their significance of this struggle to present day concerns:

> *"Bhopal disaster clearly shows that Indian Laws are weak, we need to reform them. This incident showed that all the Indian political parties are same and only one. When their own kin is not killed in this incident why to think and worry about this problem. This shows that Indian media likes the cases and matters in which females are involved. They will show those matters 24 hours on Television. Why CBI didn't file a review petition in the apex court when it amended the charges to incorporate lenient sections of IPC including 304-A (causing death by negligence) from 304-II (culpable homicide not amounting to murder).*
> *Why Warren Anderson was not brought before the Indian Courts?*
> *Why Red Corner Notice was not issued against the Warren Anderson?*
> *Reform The CBI, Reform Indian Law*
> *Be aware Indians The government of India is going to pass the nuclear liability bill which will guarantee to all the foreign companies that if something happens in Nuclear plant in India the company will pay minimum money as compensation."*

After presenting the historical context of the story through an extensive timeline, he then concludes his blog post with these key points that need to be remembered. The creation of these points involves a translation process of what the aggregate of these legal events mean. Therefore, the making of story sometimes requires subject matter expertise as well as careful analysis and synthesis.

Another example of this translation process occurs in Debosmita Nandy's *Bhopal Verdict: A Nation Held Guilty* extensive blog post. She attempts to translate the legal jargon associated with the Bhopal disasters and then presents an extensive "news analysis" of the Bhopal disaster using "simple language" to make it accessible to a large audience, as she explains in her comments. In an interview with her, she emphasizes that as a lawyer she wanted

to "sensitize her audience to the various socio-economic and legal perspectives" that encompasses this disaster. One comment she received in response to this blog post was:

> *"I read each and every word of this post just to make sure that there is not a single legal jargon..trust me, this was the most difficult post for a lawyer to execute for general people, and that too when you are unwell..you know, at each reference I was wondering, man, how did she write this in simple language? wouldn't legal language have been simpler to write?"*

Nandy received many other positive comments emphasizing how it was a "riveting read" in part because her "endeavor was to give information people are not aware of" and to present the large body of information in a way that is digestible with "no legal jargon." Such diligently written blog posts unpacking the complexity of historic crises like the Bhopal disaster helps readers easily digest, remember, and understand the complex story of Bhopal.

Story making is the creative part of the curation process; it is a craft. Blog posts like Nandy's are examples of crafting a verbal story with words, which is a familiar format to most people. However, in the social media landscape, crafting a story is occurring in different formats involving different software and technical practices. Drawing from Lessig's (2008) notion of the "Read/Write (RW) Culture" where people are remixing content to create mashups of all types, many of the YouTube videos pertaining to the Bhopal disaster and the 9/11 attacks were mashups of videos and photos. Some were created with little effort (such as slideshows in a video format); however, other videos were mashed up and remixed in a way that had a thread weaving together all the different content to make a compelling point. Wikipedia articles and History Commons timelines can also be seen as a reference-based mashup, whereas Facebook groups tend to facilitate the mashup of links. In some cases, these mashups not only help to create a story but they also help to preserve some of the artifacts that make up this story.

In the networked world, these distributed stories illuminate the continuous nature of these historic phenomena. These stories are always evolving if they have significance to present day society; yet, this living aspect of stories also reflects the way in which these stories exist in the web age. Brad King[258] of Ball State University discusses this web-native form of storytelling as a "distributed story stream."

The distributed nature of these stories reflects the constant stream of content that are used to tell stories. What this suggests is that story making is the "tell" in the activity of "Show and Tell," where the story maker tells a story and offers a message. The "show" aspect of "Show and Tell" relates to the exhibition space or platform used to tell the story.

9.4.1.6 Exhibit and Juxtapose

Another aspect of curation involves exhibiting the story in a compelling way by juxtaposing the memories or artifacts within the story. As previously mentioned, exhibiting is the "show" aspect of "Show and Tell," and social media services and the features within it are becoming exhibition spaces for presenting these stories. A critical aspect of making the story compelling and evoking a response from the viewer is through juxtapositions.

Based on the assessment of the curatorial activities for the Bhopal "second disaster" meta-narrative, YouTube and Wikipedia scored the highest in exhibiting and juxtaposing because some of the YouTube videos were spoofs related to drinking water in Bhopal and the Yes Men's BBC hoax, both of which used creativity and artistic skills to create compelling juxtapositions regarding the water contamination in Bhopal. Twitter scored the lowest in exhibiting and juxtaposing since Twitter is limited to text. The juxtaposition between the Bhopal gas leak and the BP oil spill was more prominent than the water contamination issue in Twitter.

[258] http://www.thecultofme.com/2009/11/07/idmaa-the-distributed-story-stream

Juxtapositions are a way of displaying, arranging, and re-presenting the artifacts or memories in an effective and understandable way so that it draws attention to the message to make it more memorable. The previous two chapters contain many examples of juxtapositions that appeared in the narratives of the 9/11 attacks and the Bhopal disaster.

Many different types of juxtapositions appeared in the 9/11 narratives. YouTube videos created by 9/11 Truthers juxtaposed statements from the official story and even the 9/11 Commission report with counter-narratives from other literature on 9/11. The *Make History* website juxtaposes images taken on the day of the attacks with Street View images from Google Maps of the same location. Jon Stewart's show on the 9/11 Zadroga Health Bill used his comedic skills to juxtapose the non existent news coverage of the bill in the US mainstream media with Al Jazeera's coverage of the bill, which then helped to raise awareness of the bill in a significant way. Lastly, Worthington's blog post titled *The Year of Revolution: The "War on Tyranny" Replaces the "War on Terror"* juxtaposes the widely used phrase "war on terror" with "war on tyranny" in an attempt to explain how the terrorism narrative connects with the recent uprisings in the Middle East.

Statements that appeared in Union Carbide's Bhopal.com website were juxtaposed with more accurate statements created by the International Campaign for Justice in Bhopal at TheRealBhopal.com website as well as by Greenpeace's *Myths and Realities: The Truth Behind Union Carbide Corporation's Website on the Bhopal Accident* fact sheet,[259] both of which were distributed through social media. A more recent juxtaposition was contrasting the lack of corporate responsibility after the Bhopal gas leak with US President Barack Obama's response to the 2010 BP oil spill in the Gulf of Mexico. These juxtapositions appeared in blog posts, Twitter,

[259] http://old.studentsforbhopal.org/Assets/GP.Myths-Realities.pdf

Facebook, and YouTube, which helped to revive the memory of corporate irresponsibility and government negligence issues that occurred in the aftermath of the Bhopal gas leak.

A more creative example of juxtapositions that appeared in the Bhopal disaster narratives was the multimedia spoofs of Dow Chemical Company's Hu Human Element campaign that began in 2006. YouTube contains six videos[260] that are spoofs of Dow Chemical's Human Element TV advertisement. These videos use the audio of the Dow Chemical commercial and then juxtapose the audio with images of the Bhopal disaster, napalm, and even homelessness. Another way in which Dow's Human Element campaign was juxtaposed specifically with the Bhopal disaster was using Dow's Hu Element image and placing images of Bhopal disaster victims in the background. This project was called *Bhopal XXV* created by Stephane Bouillet.[261] In 2009, Bouillet created a series of 30 images for each day between November 3rd and December 3rd leading up the 25th anniversary of the Bhopal gas leak and assembled it into a book. Each image contains a photo of a Bhopal victim accompanied with a description about the victim's health conditions as a result of the gas leak and/or the water contamination in Bhopal. On top of the photo of the victim, is an edited version of Dow's Hu Element ad that uses "25 years" to represent the anniversary number, "1984 - ?" to indicate the ongoing crisis in Bhopal, and "D-30" to indicate the day of that photo (Figure 64). These images are now shared in Facebook groups and in blog posts.

[260] http://www.youtube.com/view_play_list?p=493CD2130EA3D55B
[261] http://stephanebouillet.com/en/project/bhopal_xxv_25_years_disaster

Figure 64: Bhopal XXV Project: Juxtaposition with Dow Chemical's Human Element Campaign Ad

Although many of these juxtapositions were created using text and through the careful placement of the contrasting texts, it is worth considering how social media features can be designed to support juxtaposing activities to help users make more compelling messages. Currently, the emerging norms that guide the behaviors in social media services (e.g., video mashups, edited images, text-based mashups) are some of the ways in which juxtapositions are encouraged. Deciding the medium to communicate one's story ultimately shapes how a user exhibits the story and adapts his or her message.

For example, in the Discussion page of the *Bhopal disaster* Wikipedia article, one of the most highly discussed issues was that the article violated the Neutral Point of View (NPOV) policy, which is the fundamental principle of Wikipedia that all articles must follow. The article was created on November 6, 2002, but these discussions were first raised in October 2006 up until October 2008. Wikipedia editor A pointed out that part of this article "reads like a Greenpeace pamphlet" making it less objective and neutral in stance. Wikipedia editor B explains that the article should not be sympathetic nor in opposition to its subject, it should not endorse nor discourage viewpoints, and debates should be clearly described, represented and characterized, but not engaged in. Wikipedia editor C argued the following:

> *"Regardless of the body of evidence against UC [Union Carbide], an article of this nature needs to express all sides of the story, not just the one with the largest body of evidence. The ideal situation would be an article sourced entirely by external sources, but in absence of that it needs to include at least sources from both sides, which it does only superficially."*

There is a section entitled "Union Carbide's defense," which explains the investigation into the possible sabotage that Union Carbide proclaimed as the cause of the gas leak, but much of the historical evidence and scientific reports gathered by respected scholars challenge0 Union Carbide's version of the story. Furthermore, Wikipedia editor C later commented that "the tone and approach" that the earlier version of the article had was "more of an editorial indictment than an encyclopedic article."

In looking more deeply at the Discussion page of Wikipedia articles, it is important to consider how sociotechnical features like this "talk page" in Wikipedia can better facilitate a discussion on how to improve an article collaboratively from multiple perspectives. Ultimately, such discussions help to determine what memories should be added or deleted as well as how these memories should be presented in a compelling way so that the multiple viewpoints can clearly be distinguished to allow the viewers to make their own interpretation of the juxtaposing narratives.

The curatorial activities of exhibiting and juxtaposing involve decisions around what type of media to use to share the story and how to use the media in a way that communicates a message through juxtapositions. Media are both exhibiting platforms for viewing a story and distribution channels for sharing a story. Ultimately, what makes the story memorable is if the exhibition of the story creates a compelling experience. In the social media landscape, these exhibitions are embedded within different parts of social media services allowing these exhibits to harness social distribution features and foster conversations.

9.4.1.7 Guiding and Conversing

One final aspect of curation involves guiding and conversing, activities often associated with docents. Since social media services fundamentally facilitate conversations and engagement with the public, one might argue that many social media users engage in docenting activities. Typically, docents are knowledgeable guides, community leaders, mentors, and enthusiasts who volunteer their time to interface with the public and share knowledge about a particular topic. Many of the social media users I interviewed and observed were personally motivated to volunteer their time to share their knowledge and engage in conversations with others about the crisis. Therefore, there is no financial motivation to engage in these curatorial activities; instead, it is about educating the public and engaging in conversations with them.

Based on the assessment of the curatorial activities for the Bhopal "second disaster" meta-narrative, Facebook scored the highest in conversing and guiding because Facebook groups and pages tend to facilitate more conversations through wall posts, comments to wall posts, and discussion pages. Facebook has become ubiquitous at a nearly global level making it the central hub for engaging in social conversations remotely and asynchronously. Flickr scored the lowest on conversing and guiding because many of the photos did not receive any comments. Although some Flickr photos on more controversial topics generate hundreds of comments, most Flickr comments in general are oriented towards aesthetic and photographic concerns.

The features within social media may simultaneously facilitate conversations and engage others to participate in other curatorial activities. For example, the Talk page in Wikipedia articles, the discussion page and commenting feature in Facebook groups and pages, the discussion section and commenting feature in Flickr, the commenting feature in blogs, and the @reply/mention feature in Twitter are all examples of technical features that allow users to engage in conversations and guide others to additional information relevant to the subject of

interest, in this case the historic crisis. Conversing and discussing activities seem to always be happening in the background with social media and these types of social features are encouraging the wider public to participate in other curatorial activities.

For example, a former administrator for the *9/11 Truth Movement* Facebook group stated in an email interview:

> *"My hope as an administrator and participant, back then, was to learn and discuss some of the 9/11 issues I found interesting. It was rather cool to have a place to share ideas and to figuratively listen to others' viewpoints, opinions, and experiences…I think that such groups have been a good place for people with interest in the same topic to come together and try to make sense of the events in the world around them…I would say it may be more grounded in a desire to communicate with others and a desire to be plugged into an outlet where you can hear thoughts and share your own…In terms of Facebook features, I think the wall and discussion topics have been important in the function they served as communication vehicles. Now, though, I think Facebook has become too creepy with their questionable privacy and data-collection policies. Almost everything, particularly the Facebook groups, is publicly viewable now and indexed in search engines like Google and Bing so many people may be deterred from engaging in discussions as they otherwise would have."*

The power of social media lies in the conversations that have evolved online and the truth-seeking and sensemaking activities that occur to better understand distressing phenomena like crises. However, the fact that many of these conversations are now automatically archived and indexed to make them publicly available and easily searchable online may become a mixed blessing. Both the Bhopal disaster and the 9/11 attacks contain contentious narratives, and the crisis narratives presented in this dissertation provide a glimpse into the some of the opportunities and consequences that are unfolding for members of the public, corporations, government officials, and other stakeholders.

Although there is a desire to openly allow others to post content and comments, it is worth recognizing that some of these social features, such as commenting, are increasingly under spam attack. Many of the public Facebook groups that were not active or constantly updated

contained wall post spam. Although Facebook is trying to manage this problem at the systems level by developing spam filters, Facebook users are having to engage in editorial activities to ensure that these social features are not abused and do not deter others from engaging in conversations. In addition to having to filter out spam, YouTube videos, especially those with high views and comments, tend to contain offensive remarks. It is because of these emerging behaviors in social media that has led some to disable social features like comments and discussions.

Guiding could be human or machine-powered. Some social media users have become experts on a particular topic or a particular social media skill and can act as guides that lead viewers to other relevant content. One can argue that the people who share links to a Facebook group and in Twitter are guiding people to other relevant content to include in a collection or, more broadly, to include as part of the living heritage of that particular topic. There are also social media services that embed recommendation systems into their sites and provide automated features that guide viewers to other relevant social media content. For example, YouTube offers a list of "Suggestions" on the right of side of every YouTube video allowing one's curiosity to endlessly explore other related videos.

Conversing is a human activity, but conversing in the social media landscape is augmented in a way that allows conversations to occur at a much wider scale as well as synchronously and asynchronously. Conversing is the human element of the curatorial process and it would be potentially unconscionable to try and automate this discussion process, since social media is meant to enable conversations between people powered by web services and machines. However, new features and tools could be designed to enable users to make it easier to engage in discussions, provide feedback, and listen to their audience. People are beginning to

engage in these activities in a more streamlined way by making it a part of their everyday routine because of the nearly ubiquitous access to the Internet and social media anytime as well as the pervasive use of ICTs and mobile devices.

9.4.2 The Socially-Distributed Relationships Between the Curatorial Activities

The previous subsection provided descriptive details of what each of the seven curatorial activities mean in practice based on the assessment of the initial conceptual model of curation with the Bhopal "second disaster" meta-narrative and a broader analysis of curatorial activities that generated the crisis narratives pertaining to the Bhopal disaster and the 9/11 attacks discussed in Chapters 7 and 8. This subsection explains the socially-distributed relationships between the seven curatorial activities. Although I describe the relationships between each curatorial activity sequentially (clockwise in the upcoming figures) from *preserve/maintain* to *guide/converse*, socially-distributed curation tends to be a nonlinear process with cyclical relationships within the process itself.

9.4.2.1 Curatorial Activities Related to Preserving and Maintaining

Preserving and maintaining is an action built into the social media landscape. Figure 65 shows gray arrows that point from the *preserve and maintain* activities to the other six curatorial activities; I refer to these relationships as **propagation as preservation**. What this means is that a memory is preserved and maintained if a user finds an artifact about that memory and stores it online somewhere, publicly tags an artifact indicating that it contains this memory, publicly verifies that this memory in an artifact is authentic, creates a story about that memory, displays the memory in a public medium, or discusses this memory in an online social forum. Any of these digital traces have the potential to preserve the memory, since these traces may appear as

links that can be shared or may be indexed by a search engine. However, the memory will likely stay alive longer if all these curatorial activities are carried out continually.

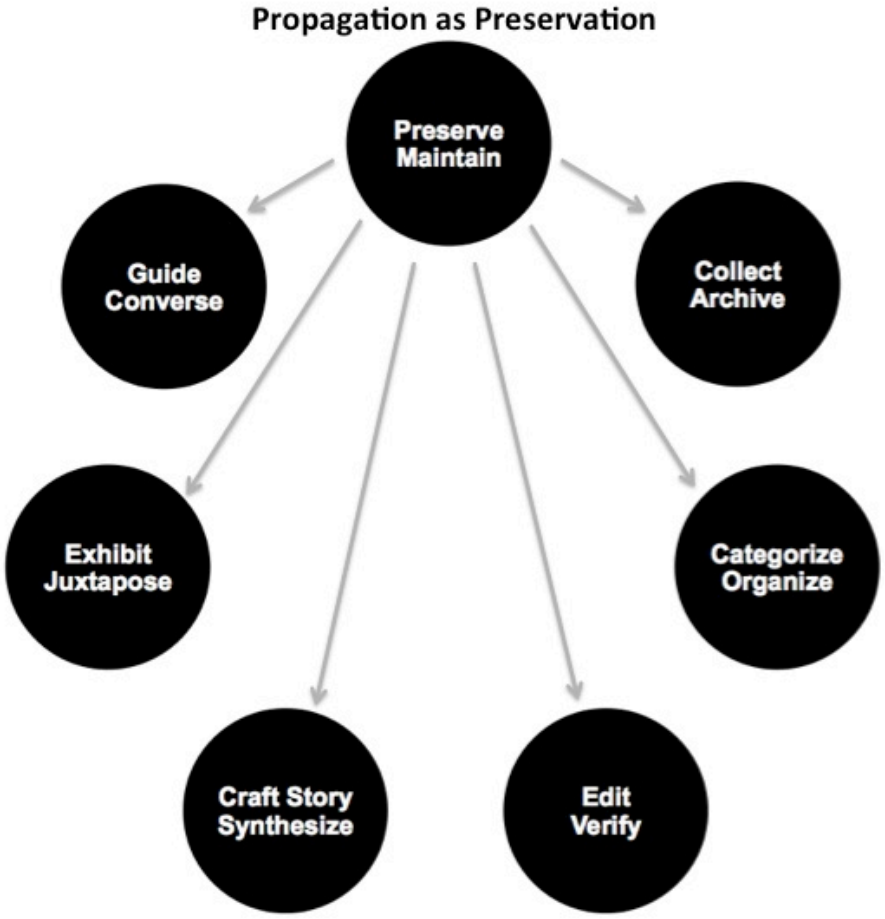

Figure 65: Curatorial Activities Related to Preserving and Maintaining

Additionally, the act of crossposting facilitates the preservation of a memory. This could mean conducting the above activities in multiple places online or posting a representation of this memory in multiple places online. This ensures that copies of this memory appear in different locations across the social web. Although software is being used to facilitate the propagation of these memories and messages by supporting these different curatorial activities, it is the widespread dissemination and visibility of these activities that help to ensure its longevity in the wetware—as a biological memory in the human brain.

Viral preservation is also another way to keep the memory alive. Many social media services allow their content to be embedded in other websites. For example, YouTube videos can be embedded directly into a blog without having to watch it directly through YouTube. Photos from a Flickr group may also be viewed on a separate website without having to go to Flickr. This ability to view the content in the context of other material without having to go directly to the social media service in which it is stored or hosted typically increases the number of views of that social media artifact in a way that is much quicker than through the social media service alone. Being able to substantially increase the number of views, especially on the same day it was posted, increases the potential of making the message of the artifact "go viral." Yet, it is important to be aware of how algorithms power these analytics in a way that makes it "go viral" online. NufffRespect,[262] who uploaded the *9/11: Total Proof That Bombs Were Planted In the Buildings!* YouTube video, explains in his blog how algorithms can censor content in YouTube:

> *"The primary method YouTube uses to suppress videos is to manipulate the view counter that is displayed below the video itself. The evidence strongly suggests that YouTube (i.e., Google) is deliberately stopping the view counters at 300 views in order to give their algorithms time to decide which videos should be suppressed and which ones should not. The purpose of this is to stop your video from reaching the first page of the most-viewed lists for that day. With 100,000 views, your video would most certainly reach the first page of the most-viewed list for that day. Once your video has been up on YouTube for 48 hours, it can no longer appear in today's most-viewed lists—and this is where most of the views for a viral video will come from in the first place. In most cases, if your video fails to reach the first page on day one, it cannot go viral. How does YouTube know which videos to suppress when there are so many videos uploaded every minute? All the work is carried out automatically by algorithms that search through the video title, description and tags to find specific keywords that YouTube deems as controversial. They can also search through the audio of the video itself in order to find controversial words. If any of those keywords is found, the algorithm will down-rank your video to stop it from appearing on the first pages of the most viewed lists—regardless of how many views the video has actually received. This is the whole purpose of freezing the view counters when they surpass 300 views; it gives YouTube's algorithms the opportunity to manipulate the view counters*

[262] http://nufffrespect.blogspot.com/2009/06/nufffrespect-blog-faq.html

> *without being caught red-handed. It's all pretty straightforward and it can all be carried out automatically without any human intervention whatsoever. YouTube (i.e., Google) is not bothered so much about whether you post a controversial video, just as long as that video doesn't reach the front pages of YouTube—because that's where most views are generated from. However, there are countless cases where YouTube will suspend your channel if you post controversial videos—even though your videos have not violated any of YouTube's terms of use."*

NufffRespect's interpretation may or may not be true, but he draws attention to how the design of algorithms and the values embedded within them can influence what type of content receives more visibility. This is important to consider when designing algorithmic forms of curation.

Since the act of posting information about the message in any medium preserves the memory of this message, then the curatorial activity of preserving and maintaining could be treated as an action that always happens in the background. In Figure 65, gray arrows are used to indicate that preserving inadvertently occurs in the web context if any of the other curatorial activities are carried out. Preserving and maintaining memories and messages is built into people's online social media practices and into the design of the social web, since people's actions online tend to leave digital traces or digital footprints that can be indexed. In other words, preservation in the web context occurs when there are multiple copies of the message distributed online that are continually updated using the new media of the present day. Future technological systems should consider whether it is valuable to show the distributed locations of these copies and how frequently they are updated to more explicitly reflect its living nature.

Still, there will always be the need and the urge to preserve the medium in which the message originated, especially if it is a specialized medium that produces ephemeral data. Therefore, one must consider the value of preserving the medium if that is of higher priority. This could mean replicating the medium in a way that is usable with the state-of-the-art or transferring the same values and practices of an obsolete medium to the new media of today. For

example, preserving Twitter could mean replicating this social media service by adapting this web service in a way that makes it fully functional with current systems or designing a new service that supports many-to-many, real-time communication of short messages that are publicly available. Preserving the medium may not always be a priority, but if the medium itself is what is worth remembering, then it is particularly up to the designers the medium to keep it alive and functional for a new generation of users.

9.4.2.2 Curatorial Activities Related to Collecting and Archiving

Collecting and archiving is a curatorial activity associated with finding, gathering, and storing artifacts that contain the memory that needs to be kept alive. The purpose here is to build a collection. This collection-building activity contains multiple direct and indirect relationships.

The *collect/archive* curatorial activity often occurs in conjunction with the *categorize/organize* and *edit/verify* curatorial activities. I refer to this set of curatorial activities as the **collect-organize-edit (COE) process**, as shown in Figure 66 with the parallel lines shaped in an oval to connect these three activities.

The parallel lines between *collect/archive* and *categorize/organize* marked as **COE 1** means that after collecting a set of artifacts, then the artifacts are classified using keywords and tags. If the collection is large, then categorizing may also lead to sub-collections that breakdown different aspects of the memory that needs to be kept alive. For example, the History Commons timelines can be viewed as one large collection, where the project managers create first-order and second-order categories to classify all the events in the timeline. This allows other users and visitors to look at a more specific collection that pertains to a particular memory of interest, where they may potentially add additional events to expand that sub-collection.

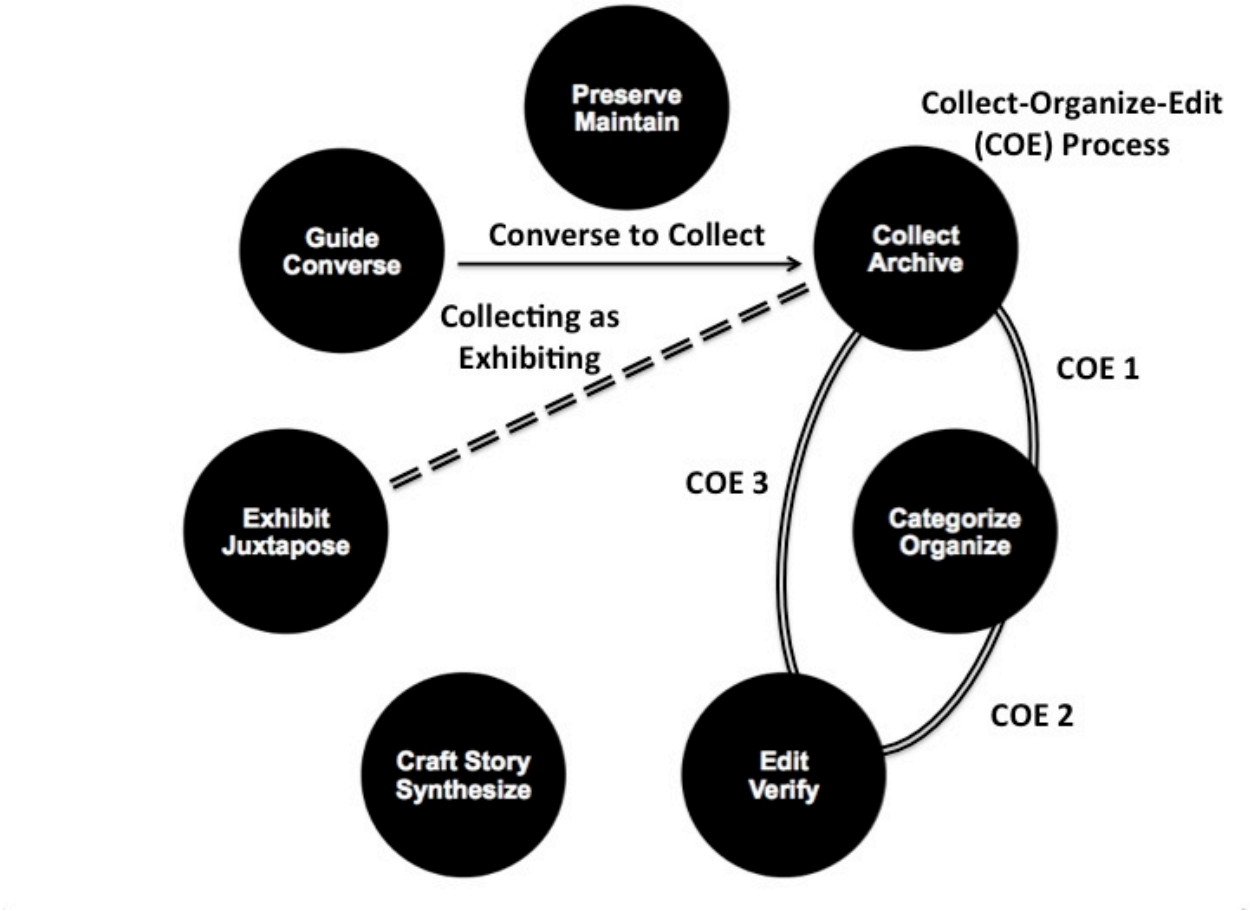

Figure 66: Curatorial Activities Related to Collecting and Archiving

The parallel lines between *categorize/organize* and *edit/verify* marked as **COE 2** in Figure 66 will be discussed in the next subsection. However, it is important to consider the cyclical relationship between the three activities in the COE process.

The parallel lines between *collect/archive* and *edit/verify* marked as **COE 3** in Figure 66 illustrates similarities in filtering behavior. On the collection side, it is necessary to identify trusted sources and filter these sources for relevant artifacts to include in the collection. This activity is often more visible, since people are constantly aggregating content and sharing it as a wall post in Facebook groups or in tweets using Twitter. Typically, before people share this content, they verify it by checking to see if the content is relevant and/or credible. On the editing

side, a collection of artifacts are needed first to then be able to filter out irrelevant artifacts and to verify the authenticity of the artifacts. Filtering is likely to be more invisible, since it occurs at the cognitive and algorithmic level that tends not to be externalized in the interface of current social media services. On the other hand, authenticating may often be more visible because people tend to explicitly indicate the source of the artifact and externalize this information to make it more credible. Generally, the editing activity is critical when it is an open archive that allows anyone to add to the collection.

The dashed parallel lines between *collect/archive* and *exhibit/juxtapose* in Figure 66 is the **collecting-as-exhibiting** activity, which means that the collection site can simultaneously be an exhibition site. For example, Facebook groups are places where people share memories through links, photos, and videos. An earlier version of the Facebook group interface separates these media types and allows users to browse through these media-based collections using the tabs at the top of the group or a preview of them in boxes on the left side of the group below the "members" box. The Facebook group environment can also be viewed as an exhibition space, where group members can collaboratively juxtapose carefully selected artifacts on the wall to communicate a message and have it publicly viewable for others to see on display.

The last relationship is the arrow from *guide/converse* to *collect/archive*, which I refer to as the **converse-to-collect** activity in Figure 66. When the collection is an open archive that allows anyone to contribute, certain media platforms allow viewers to offer suggestions on other relevant artifacts to add to the collection. In the case of a public Facebook group, members can use the wall post or comment feature to simultaneously discuss and share relevant artifacts, which automatically become a part of the collection.

Collecting and archiving are primarily carried out manually within these social media services. However, I envision the possibility of integrating a tool within the collection or exhibition site that conducts automatic searches on a particular topic and then has the ability to detect relevant content while filtering out irrelevant content, like spam. This filtered stream helps to reduce the noise and allow users to more quickly identify relevant artifacts and easily add them to the collection in context, since it is embedded in the same place as the collection itself.

One other type of tool that is needed is having the ability to automatically harvest metadata when adding an artifact to a collection to help the user retain the context of the artifact and save the user time by not having to do this manually. Harvesting this metadata would allow users to browse the collections based on other factors, such as creation date, number of views, number of comments, etc. Wikipedia, YouTube, and Flickr provide some of these search capabilities but social media services like Facebook do not allow users to browse through Facebook groups and the content within a Facebook group based on metadata like the creation date or number of members. Tools like combinFormation,[263] which is "a creativity support tool that integrates processes of searching, browsing, collecting, mixing, organizing, and thinking about information" that automatically harvests metadata while allowing users to edit it as well, are a step towards helping users find relevant information in a more dynamic way.

9.4.2.3 Curatorial Activities Related to Categorizing and Organizing

Categorizing and organizing is a curatorial activity associated with classifying and cataloging the artifacts in a collection so that they can easily be searched and retrieved. In the social web context, folksonomic tagging has become an emerging practice that allows bottom-up, non-hierarchical labeling to dictate the organization of social media artifacts. Although this

[263] http://ecologylab.cse.tamu.edu/combinFormation

activity is meant to strengthen an artifact's metadata, folksonomic tagging has pushed the boundaries of what should be considered as metadata. In some cases, social media users tended to put the memory and/or the message in the metadata itself to ensure its existence by being searchable online and indexed by search engines. For example, some users pasted long text of information about the memory in the captions of Flickr photos and in the descriptions of Facebook groups. Since search engines rely heavily on these metadata fields to find relevant content, users have adapted their message to ensure these memories will be indexed and preserved in the social web.

The *categorize/organize* curatorial activity contains relationships to four other activities as shown in Figure 67. In the previous section regarding the *collect/archive* activity, I explained this activity's relationship to the *categorize/organize* activity in terms of being able to create sub-collections. The relationship between *categorize/organize* and *edit/verify* marked as **COE 2** means that classifying the collection facilitates editing activities, since categories and tags help to filter and select content more easily. At the same time, verifying the artifacts in a collection and assessing their authenticity can also provide additional metadata to include for each artifact in the collection to ensure that information about its credibility is documented.

The relationship between *categorize/organize* and *craft a story/synthesize*, what I refer to as **synth-organize**, means that the categories used to organize a collection can also be used for synthesizing the meaning of the collection. For example, the categories for each of the History Commons timelines provide an extensive overview of a particular project or complex phenomenon, which makes it easier to craft a story that attempts to encompass the multi-faceted aspects of the phenomenon as illustrated in the categories. At the same time, synthesizing also

informs the categorization process by drawing out the themes from a story and turning them into categories that appear in the metadata fields.

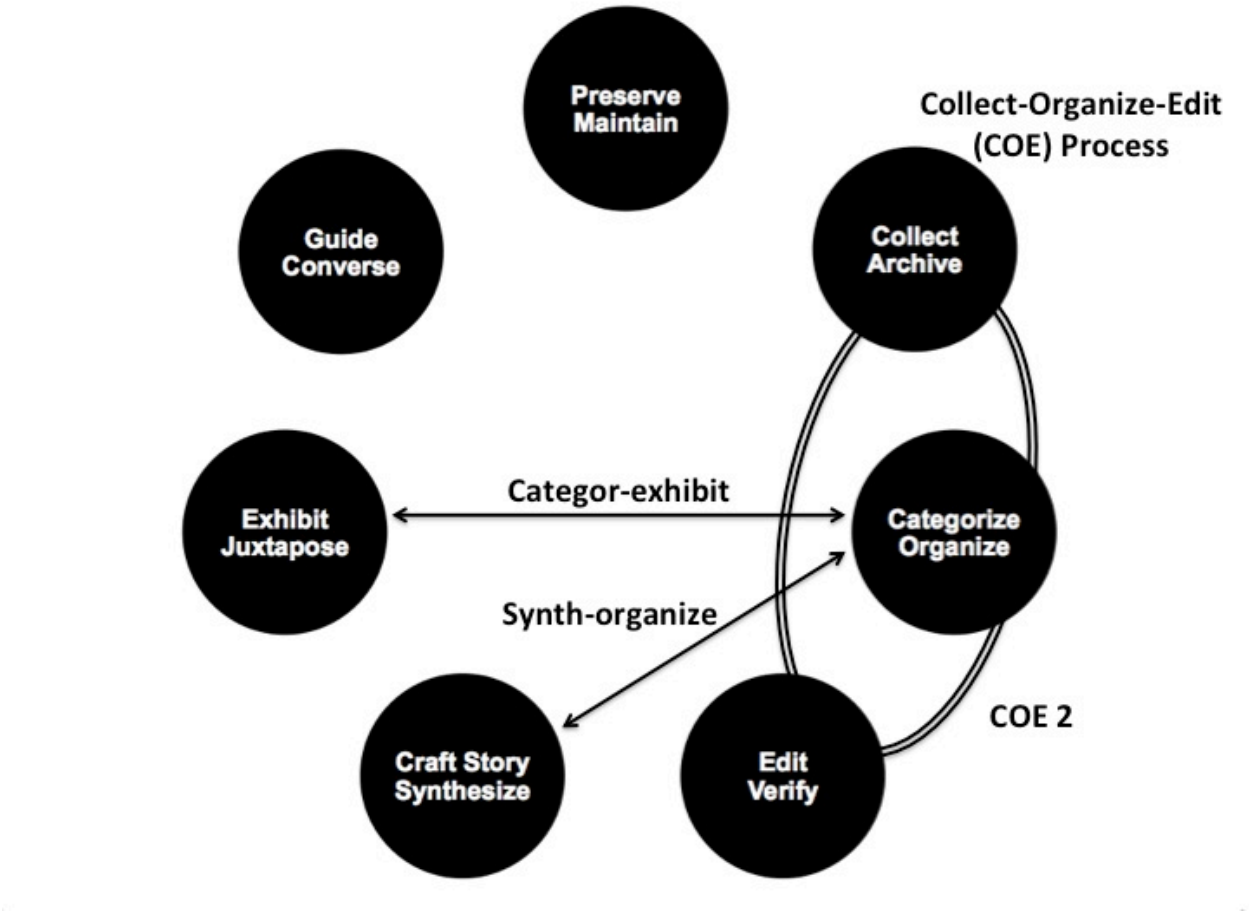

Figure 67: Curatorial Activities Related to Categorizing and Organizing

Last, the relationship between *categorize/organize* and *exhibit/juxtapose*, what I refer to as **categor-exhibit**, means that the way in which the collection is organized and categorized may influence the type of exhibition medium that could be used to best represent the artifacts. For example, if the categorization of the artifacts is multidimensional, then it may be worth displaying these artifacts in a three-dimensional environment. At the same time, a certain medium that is likely to be used as an exhibition space may dictate how the collection is organized. This was alluded to earlier with regard to Facebook groups as a collection site.

Categorizing and organizing activities have the potential to be automated in sophisticated ways. Human categorization will always be more effective; however, natural language processing (NLP) techniques have the potential to learn from human categorization activities and apply this machine learning technique to larger datasets. Since humans cannot categorize the constant stream of data that people are generating, there is a critical need to automate this categorization process. In addition to having machines learn how humans categorize information, NLP techniques like keyword extraction can also augment this categorization process by suggesting tags rather than having to generate them from scratch.

9.4.2.4 Curatorial Activities Related to Editing and Verifying

Editing and verifying is a curatorial activity associated with filtering out irrelevant artifacts, carefully selecting particular artifacts to include in a story or exhibit, and verifying the authenticity of an artifact. As I discussed in Section 9.5.2.2, the **collect-organize-edit (COE) process** shown in Figure 68 includes the *edit/verify* activity, which typically occurs in conjunction with the *collect/archive* and *categorize/organize* activities.

This type of curatorial activity has become increasingly difficult to do manually when there are a large number of artifacts, and thus requires the aid of technical tools. As the stream of content widens into a constant fire hose, there is a growing need to design software that helps users sip from the fire hose and extract relevant and reliable information. Beyond the need for filters, there are algorithmic editors that pervade the Wikipedia environment. Many Wikipedia articles are constantly edited by bots, some of which help to improve the article by efficiently dealing with vandalism, citations, and other stylistic issues in Wikipedia. Spam is becoming an increasing problem in Facebook and human reports of spam do not seem to be effective enough in removing spam from wall posts. Although editing and verifying can be instrumental to

collection building, the key aspect of editing is having the ability to thoughtfully select a set of artifacts and weave them together in a way the presents a compelling and memorable story.

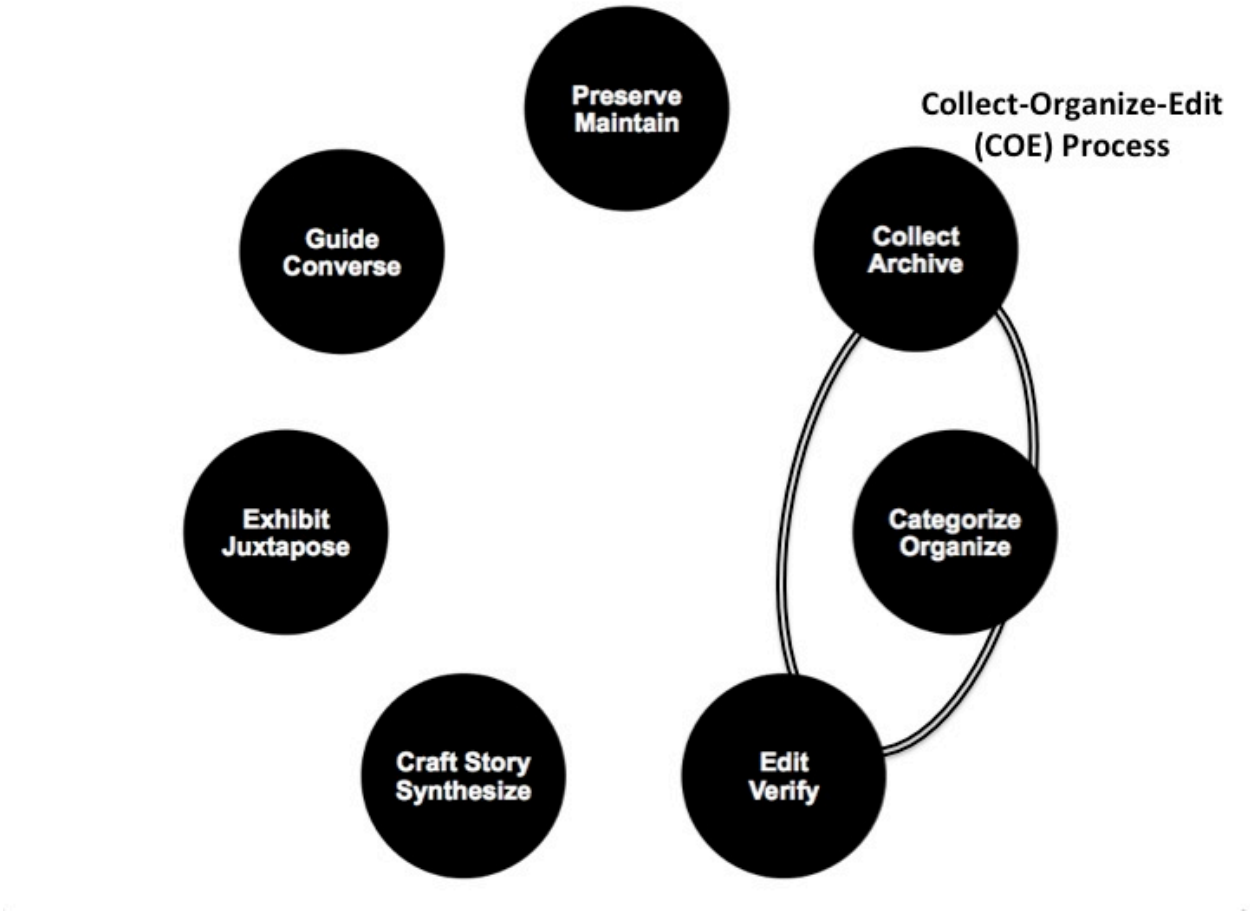

Figure 68: Curatorial Activities Related to Editing and Verifying

9.4.2.5 Curatorial Activities Related to Crafting a Story and Synthesizing

Synthesizing and crafting a story is a curatorial activity associated with summarizing and weaving together a set of artifacts to tell a memorable story. Crafting a story also means providing context and creating meaning. This curatorial activity contains three types of relationships, as shown in Figure 69. The relationship between *craft a story/synthesize* and *categorize/organize* called **synth-organize** was discussed in Section 9.5.2.3.

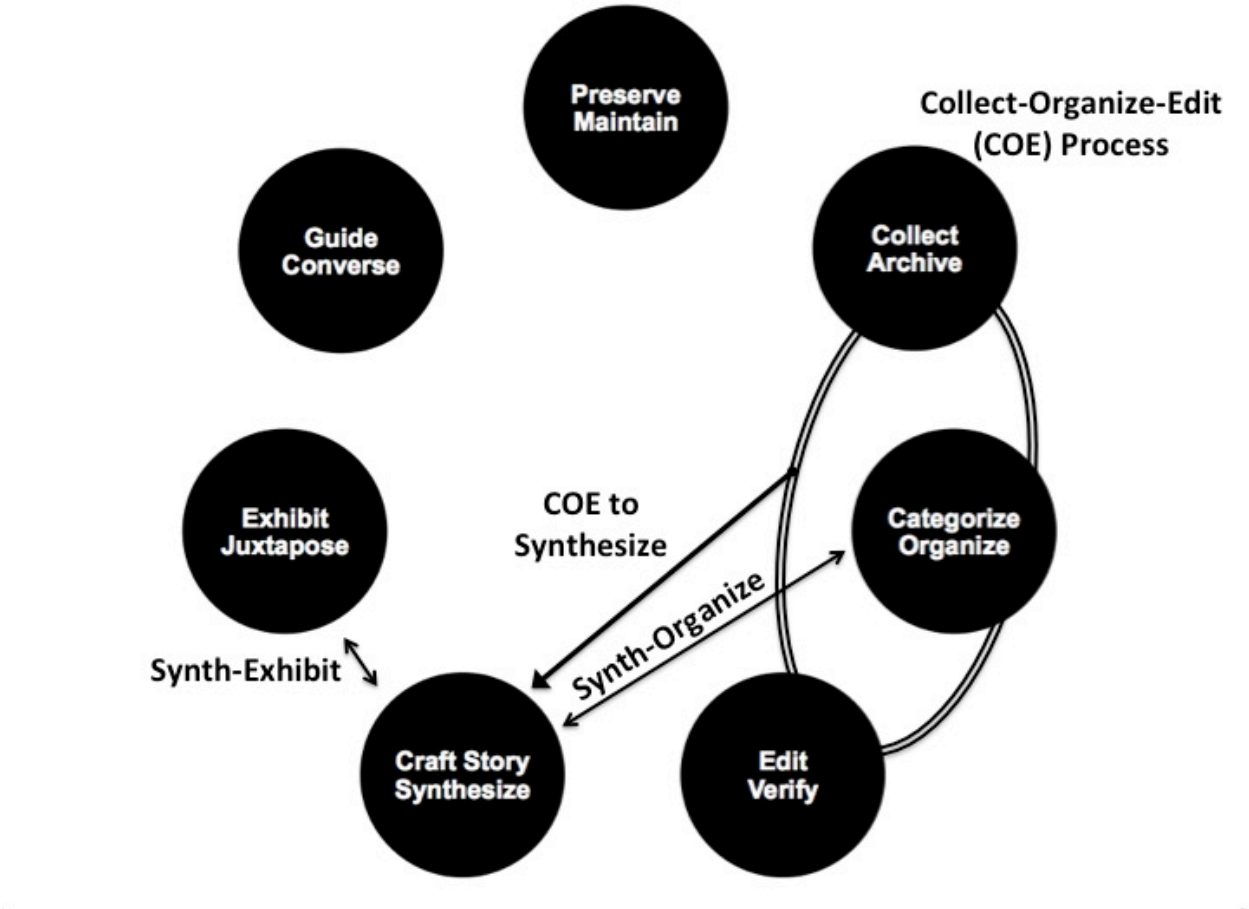

Figure 69: Curatorial Activities Related to Crafting a Story and Synthesizing

The second type of relationship occurs with the **collect-organize-edit (COE) process**. Typically, the **COE process** facilitates the crafting of a story, what I call **COE to synthesize** in Figure 69. In other words, the three COE activities lead to synthesizing the meaning of the artifacts in the collection. This synthesis process facilitates the crafting of a story around a set of artifacts based on common themes that emerged from the categorization process.

The third type of relationship occurs with the *exhibit/juxtapose* activity, what I call **Synth-Exhibit**. The craft involved with creating a story is often influenced by the medium one chooses to exhibit the story. Similar to the relationship between *exhibit/juxtapose* and *categorize/organize* mentioned in Section 9.5.2.3, the user has at least two choices: (1) adapting

the story or message to the medium or (2) adapting the medium to the way in which the story was crafted while taking into account the unique features of the artifacts in the story. There are tradeoffs in either choice. It is important to consider whether a familiar and ubiquitous medium is necessary so that the story can be easily shared. Would it be advantageous to choose a new type of medium that mirrors the message being conveyed in the story? Does the limitations of the new media of today outweigh the ability to share the story and communicate the message? For example, Wikipedia is becoming an increasingly popular and pervasive resource. Given Wikipedia's neutral point of view (NPOV) policy, does this format and social norm hinder or enable a story from being heard? These are the questions one must consider when deciding how to best present the memory, message, and story that needs to be preserved.

Synthesizing is an activity that is starting to become automated. Facebook has attempted to do this when a link is shared by offering a snippet and a thumbnail with the hyperlink. This feature is subtle and powerful yet limited. It does not require a lot of computation to do this and it makes it easy for people to quickly decide if it is a link worth pursuing or ignoring, but the current version does not allow the user to decide what goes into the snippet, only what thumbnail to use with the hyperlink. Web users have long been accustomed to automated syntheses with the pervasive use of ICTs like Google search.

The more challenging question is whether the activity of crafting a story should be automated. Qwiki[264] is an example of a recent web service that attempts to create an immersive information experience by mashing up content from multiple data sources. It then tells a story from it through an interactive video presentation that allows users to click different pieces of the video to view the source of the content. Although it provides a unique experience different from

[264] http://www.qwiki.com

manually reading snippets from a Wikipedia article and browsing Google Images on a particular subject, the computer generated voice narrating the story and the irrelevant information and images that sometimes appear in the video are reminders of the need for human discernment while harnessing the ability of algorithms to scale up. Therefore, one must question whether crafting a story should be done manually to allow for human discernment activity or if the crafting of a story can be automated using an algorithm. I would argue that even if algorithms were designed to automate the entire story making process, this potentially could diminish the creativity that humans offer to make the story and its message socially meaningful.

9.4.2.6 Curatorial Activities Related to Exhibiting and Juxtaposing

Exhibiting and juxtaposing is a curatorial activity associated with presenting the crafted story in a compelling way through juxtapositions and determining the distribution channel for disseminating the story. In the previous sections, I explained this activity's relationships to *collect/archive* called **collecting as exhibiting**, to *categorize/organize* called **categor-exhibit**, and to *craft a story/synthesize* called **synth-exhibit**, as shown in Figure 70.

Here, I discuss the relationship between exhibiting and juxtaposing with *guide/converse*, what I call **converse-exhibit**. Exhibiting involves deciding an exhibition medium. Similar to the other relationships associated with exhibiting and juxtaposing, the user must decide whether it is appropriate to choose a medium that allows for conversations to occur with the viewers. Discussions with viewers can inspire new ways of curating the story being exhibited and offer insights on other related artifacts to include in the story or the larger collection. On the flipside, engaging in conversations first at venues that draw the type of audience the story is intended for may facilitate a stronger connection to the audience and engender empathy for how to best tailor the story and juxtapositions to this audience.

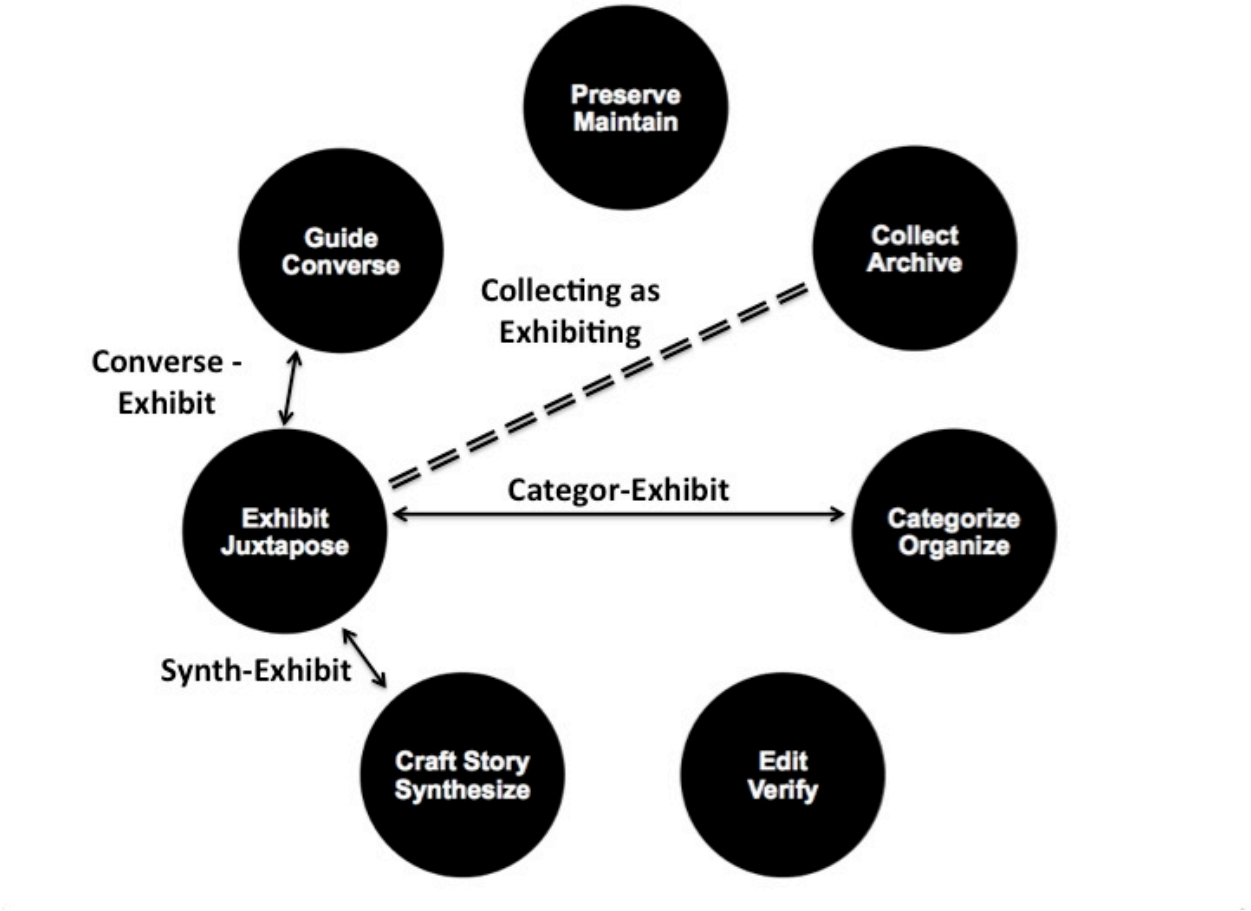

Figure 70: Curatorial Activities Related to Exhibiting and Juxtaposing

Many of the exhibiting platforms analyzed in this dissertation are basic websites, social media platforms, and other types of web services. Although familiar interfaces can be more advantageous to use as an exhibiting platform so as to not distract the audience with a new tool to learn, new interfaces are beginning to emerge that can fundamentally change how users share stories and engage in exhibitions. Mobile touch interfaces, gestural interfaces, and augmented reality are a few examples of emerging interfaces that will change the way we interact with information and cultural memory more broadly. Algorithms could also be designed to detect juxtapositions in texts and images as a way of suggesting artifacts to choose for the exhibit as well as the larger collection. For example, pattern recognition algorithms could be used to detect

patterns of juxtapositions or look for a couple of patterns in the collection that could provide inspirations for juxtapositions.

9.4.2.7 Curatorial Activities Related to Guiding and Conversing

Guiding and conversing is a curatorial activity associated with leading viewers through the story and exhibit and engaging in discussions about related topics. Previous sections of this chapter associated these activities with the role of docents, who tend to be volunteers and community leaders that enjoy having conversations with the public who want to learn more about a particular exhibit. I would argue that social media services have augmented the wider public's docenting skills. Social media users increasingly use these web services to engage in conversations with other like-minded people to learn more about a particular subject. Much of this occurs on their own time, but it moves beyond just socializing with friends. Social media services have become platforms that allow members of the public to share resources and educate each other through informal channels.

In the previous subsections, I explained the *guide/converse* activity's relationship to the *collect/archive* activity as **converse to collect** and to the *exhibit/juxtapose* activity as **converse-exhibit**. Here, I discuss how guiding and conversing can sometimes be a pervasive curatorial activity that leads to unintentional forms of curation in the background, what I call **converse as enabling curation**. This is depicted in Figure 71 with the dashed arrows from *guide/converse* to the *categorize/organize*, *edit/verify*, and *craft a story/synthesize* curatorial activities. These dashed arrows mean that those who provide guidance on a particular topic that is being curated may eventually participate in these other curatorial activities.

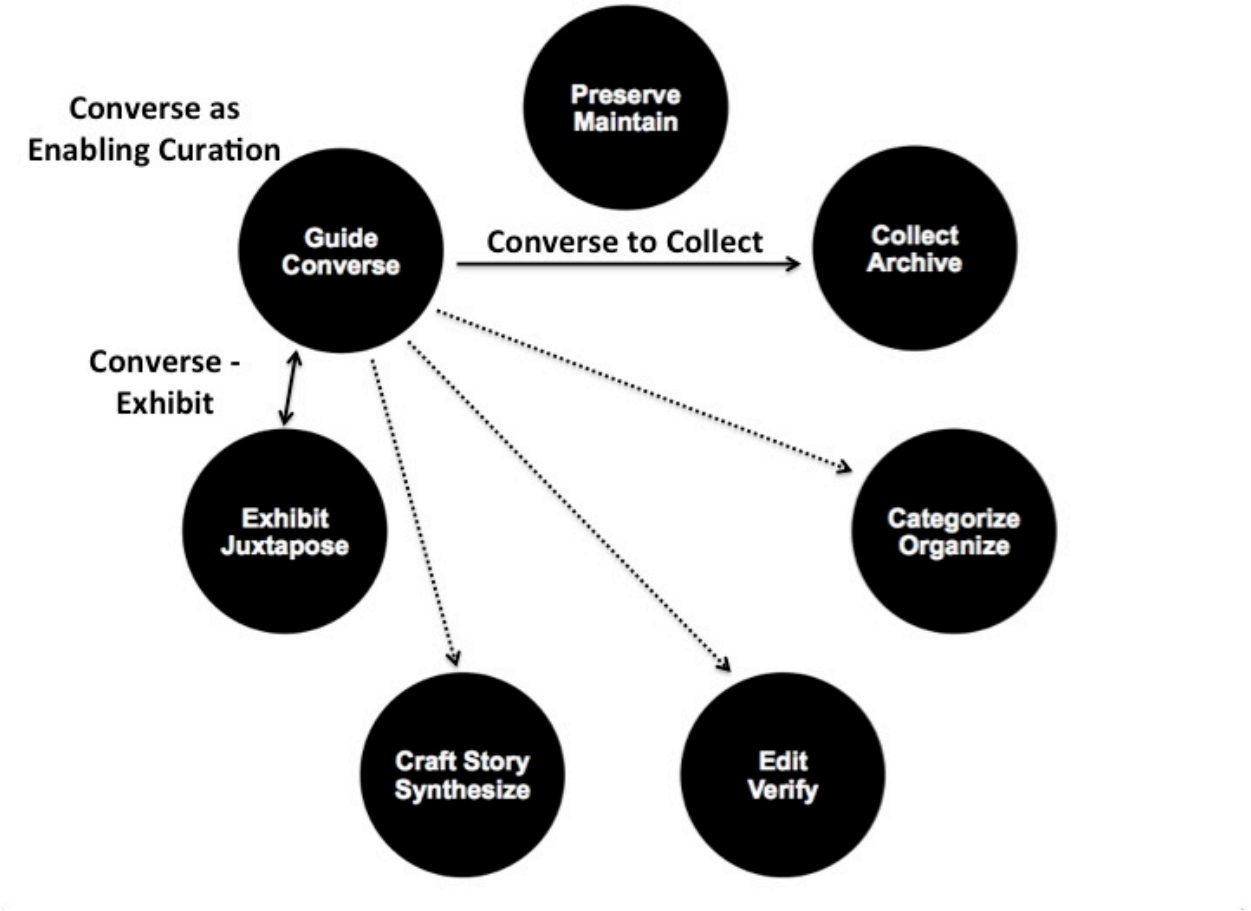

Figure 71: Curatorial Activities Related to Guiding and Conversing

Transitioning from *guide/converse* to the *collect/archive* tends to occur frequently because it is easy for people to find and share links or artifacts, which automatically gets included in a collection. The transition from the *guide/converse* activity to the *categorize/organize*, *edit/verify*, and *craft a story/synthesize* activities may occur in different ways depending on the social media service. For example, the commenting feature in many social media services allow users to engage in conversations to help guide the discussion towards particular messages that need to be remembered and preserved. Within these comments, users may provide insights on ways to organize the artifacts to draw out particular themes, draw attention to certain types of artifacts that are reputable or not credible, or attempt to synthesize

the main message of a particular topic. Such forms of guiding and conversing tends to make these curatorial activities hidden within the artifacts; they may require additional work to make these contributions more visible so that can be more directly integrated into the curatorial process.

Conversing is built into the design of social media services and has fundamentally changed the way people relate to their family, friends, coworkers, and strangers from around the world. People now have the ability to connect with others in virtual spaces and times. Each social media service and the products of their social features can be seen as microcosms that reflect different parts of cultural life and global society. The virtual journeys to the social web are no longer just driven by our own interests and curiosity by typing keywords in a search engine. We are increasingly taking advantage of the social recommendations available in our friend feeds and through social media service suggestions of "content like this." Although recommendation systems have been around for quite some time, new forms of recommendation systems are needed that tap into the social media streams and the broader cyberinfrastructure. It is through these social recommendations that will help us filter the online fire hose to give us more time to engage in deeper and more meaningful conversations about how to sustain the values and practices that are important to us and that define the heritage that we want to keep alive.

9.4.3 The Final Theoretical Model of Socially-Distributed Curation

The theoretical model of socially-distributed curation is made up of two parts. The first part includes in-depth descriptions of what each curatorial activity means at a high-level and the dynamic interpretations of each curatorial activity based on what occurs in practice, all of which were discussed in Subsection 9.4.1. The second part includes the relationships between the different curatorial activities based on what relationships occurs in practice and design

implications of what could happen in practice if technological systems were designed in a particular way to support these relationships, all of which were discussed in Subsection 9.4.2. Figure 72 is a diagram that provides an overview of all the curatorial activities and their socially-distributed relationships explained in the previous two subsections.

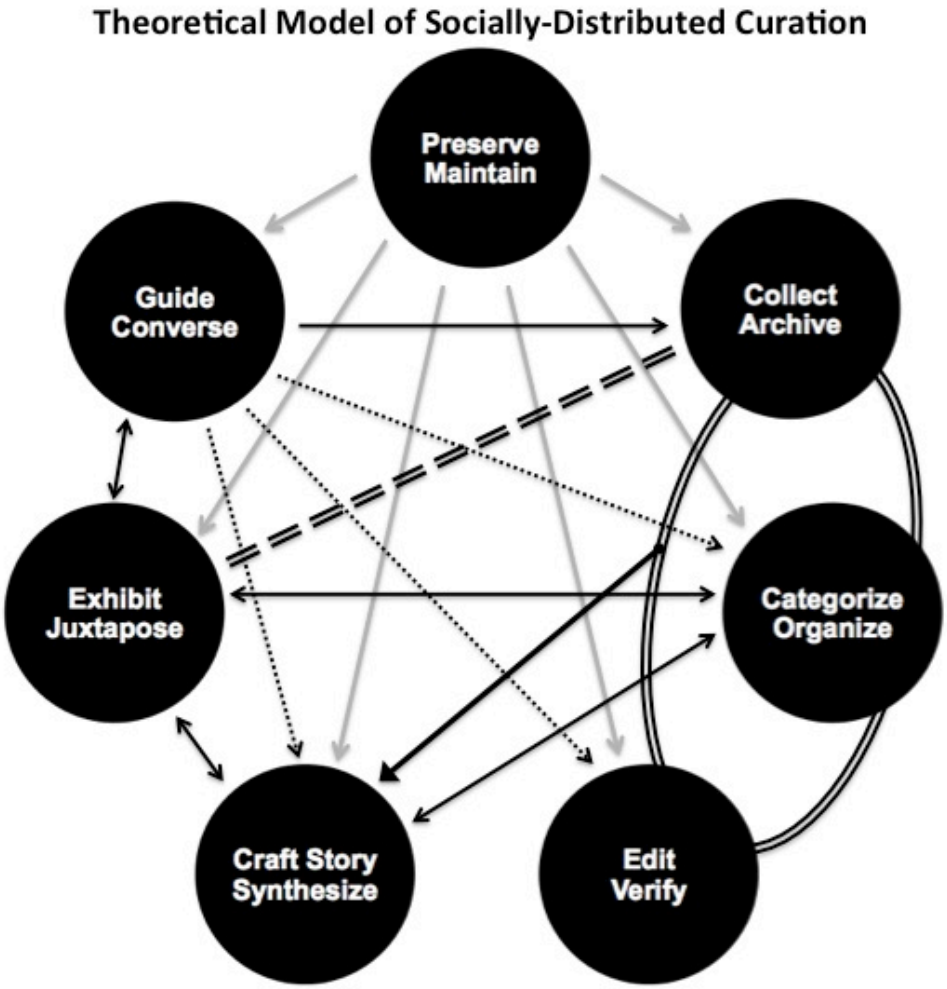

Figure 72: Socially-Distributed Curatorial Relationships

Social tagging, commenting, and ad hoc group formation within social media sites are some examples of curatorial practices that occur in socially distributed ways, what I call *socially-distributed curation*. This concept relates to the *distributed cognition* framework

proposed by Hutchins (1995) and Hollan et al. (2000) as a way to understand the "interactions between people and technologies." Hollan et al. (2000) explain this theoretical model by distinguishing the following three types of "cognitive processes" that become apparent: (1) a process that is distributed across members of a social group, (2) a process that involves coordination between internal and external structures, and (3) a process that is distributed through time to allow the products of earlier events transform the nature of later events (p. 176). The theoretical model of socially-distributed curation is defined in a similar way. First, each curatorial activity is carried out in a distributed way allowing multiple people to participate in the entire curatorial process. Second, the curatorial activities require both internal and external representations of memories to make the message meaningful and visible. Third, the curatorial process is enhanced over time by allowing past curated messages affect future curated messages. Ultimately, socially-distributed curation is successful when the curatorial process that takes place between the people, their messages, and their sociotechnical environments are seamlessly coordinated to allow this process to occur in a distributed way.

9.5 Summary

This chapter discussed the findings from studies conducted in Part 2 on *Critiquing Curation* and in Part 3 on *Developing a Theoretical Model of Curation*. Section 9.1 discussed the themes that emerged from critically analyzing literature regarding the meaning of curators as a profession. Section 9.2 discussed the themes that emerged from analyzing social media artifacts regarding the meaning of curation in the social web context. Section 9.3 explained the process of analyzing the curatorial activities that produced the crisis narratives found in Part 1. Section 9.4 presented the theoretical model of socially-distributed curation by describing each curatorial activity and then explaining the socially-distributed relationships between these activities.

CHAPTER 10
CONCLUSION

This final chapter contains five sections. Section 10.1 provides a summary of the major findings of this dissertation. The next three sections discuss the contributions of this work. Section 10.2 explains how this work expands the concept of heritage. Section 10.3 explains how this dissertation provides descriptive accounts of the living heritage of historic crises. Section 10.4 explains the present and future issues in supporting socially-distributed curation. Last, Section 10.5 concludes with a final discussion of the work presenting in this dissertation.

10.1 Major Findings

Seven major findings emerged from the work conducted for this dissertation.

(1) **Revival of historic crises through social media**: Based on the findings from the survey of social media presence for the 111 crises, it is evident that certain historic crises are being revived through social media. The deadliest crises tended to *not* be indicators of a revival in social media. Instead, the analysis here showed that past crises typically were revived when they were linked to recent crises that exhibited similar causes, effects, and vulnerabilities.

(2) **Memories of historic crises made meaningful to the present**: One of the ways in which the memories of historic crises stayed alive was by making these memories meaningful to present day concerns. Typically, these memories were framed as lessons that still need to be learned to build disaster resilient communities. It is this type of framing that encourages active participation in the process of keeping the stories of historic phenomena alive.

(3) **Dynamism reflected in social media practices**: The dynamic nature of crises and heritage as processual phenomena is reflected in the constant revisions of these crises in social media. Crises that still have ongoing effects are visible in the updates and revisions made by social media users. The real-time nature of social media also reflects the living aspects of heritage. The editing features in many social media services allow users to dynamically change content, which helps to reinforce the processual nature of crises and the living aspects of heritage.

(4) **Prospective retrospective activity as a pressing issue**: There is a pressing need to predict what we want to remember in the future. When a devastating crisis occurs, people are quickly primed to engage in prospective retrospective activity. If they believe it is a historic crisis happening before their eyes, they almost automatically document the crisis for future purposes. When people try to keep the story of a past crisis alive, they try to think of memories and stories that are worth passing on, or rather worth remembering for the benefit of future generations.

(5) **Propagating and remixing prosthetic memories**: Although social media services are contributing to the rise of user-generated memories, most of what people share are other people's memories and their content. Producing original content requires time and effort, but propagating and remixing other people's memories is becoming quick and easy to do because of the sharing features embedded in many social media services.

(6) **Adapting the message to the new medium**: One of the ways in which stories of past historic crises are kept alive in the social media landscape is by adapting the message of these stories to the new medium of today. Each social media service has its own unique features; therefore, it is up to the users to craft the message in a way that best suits the medium they choose to propagate the message.

(7) **Keeping the story alive by sharing**: To keep a story alive in the participatory age, one must share the story widely by propagating it through multiple channels. In the digital context, preservation does not mean safeguarding a single artifact. Instead, preservation means making multiple copies and distributing it widely and frequently enough so that the memory and its message become easy to remember, hard to forget, and ubiquitously shared.

10.2 Grassroots Heritage: Expanding the Concept of Heritage

One of the contributions of this work is expanding the concept of heritage by offering the term *grassroots heritage*. In this dissertation, I argue that heritage is a participatory, bottom-up process of making meaning. The descriptive accounts presented in this dissertation also provide evidence of heritage as a *living entity* and as a form of *social action*. Although heritage scholars have already argued that heritage is a living entity that should not be viewed as a thing or a site, this re-theorization of heritage is particularly intended for scholars in the field of human-computer interaction, who currently adopt a narrow view of heritage in the digital age.

Designing for digital heritage is nascent. Digital heritage in HCI is still constrained to museological concerns that treat heritage as a static entity. Although technologies are being designed in museum exhibitions to support viewer participation, it is still important to consider the preservation of heritage in its natural context to truly sustain it as a participatory and ongoing

type of heritage practice. Adopting the view of heritage as a living, social action-oriented process of making meaning will help to open up the space for designing systems that can sustain heritage in innovative ways. Future technology that is intended to support heritage concerns must consider what values are being embedded in the design of these systems, as this ultimately dictates what type of heritage stays alive.

10.3 Living Heritage of Historic Crises: A Descriptive Account

Another contribution of this work is providing descriptive accounts regarding the *living heritage* of multiple historic crises. In Chapter 6, the findings from the survey of social media presence for the 111 crises provided a broad overview of the crisis-related heritage that exists in the social media landscape. These findings offer high-level trends that can inform the design of future studies that may use computational methods and machine-learning techniques to analyze large-scale datasets collected from multiple social media services or even just one particular social media service. For example, the Wikipedia findings of heritage activities for past and recent crises are worthy of a more in-depth investigation of issues regarding the revision of history and Wikipedia's impact on historiography.

In Chapters 7 and 8, the descriptive accounts of the 1984 Bhopal gas leak and the 2001 September 11 attacks provide in-depth examples of what the living heritage of historic crises looks like in the social media landscape. Organizing the living heritage of these historic crises into the five meta-narratives—cause, survivor, ongoing effects, scientific, and direct action—is one approach to externalizing the dynamic nature of crises and their presence in the social media landscape. Although this paper-based dissertation is limited in only being able to provide screenshots and web links to the social media artifacts, one might imagine an interactive version of these crisis cases that immerses readers to not only view these artifacts in real-time but also

actively curate them to encourage a more experiential understanding of *living heritage* as well as of *socially-distributed curation*.

10.4 Socially-Distributed Curation: Now and Beyond

The third and final contribution of this work is offering a theoretical model called *socially-distributed curation*, which includes descriptive explanations of seven curatorial activities and the particular relationships that occur between these activities, as discussed in Chapter 9. Socially-distributed curation is a sociotechnical practice involving people, cultural artifacts, and information and communication technology. This theoretical model treats curation as a cyclical process, where it is can be difficult to determine the beginning and the end of a curatorial process—particularly when the products of curation may become new artifacts to curate. This type of curation also occurs in a collaborative and distributed way creating a shared ownership over the stewardship of the living heritage that is being sustained. It is a participatory, bottom-up approach that makes each curatorial activity transparent to allow other interested parties partake in the curatorial process.

Two primary types of experts are helping to sustain this curatorial process: subject matter experts and curation experts. Subject matter experts are knowledgeable about the subject being curated, in this case, having expertise pertaining to historic crises. This might include people directly affected by the crisis, researchers who have studied that crisis, or others who can share expertise related to the crisis. For example, the top contributors for the *Bhopal disaster* Wikipedia articles included a medical doctor, a chemical engineer, a chemist, people interested in the Bhopal disaster, an Indian native, and someone who likes editing current event articles and disasters.

Curation experts are those who have expertise in conducting any of the curatorial activities previously mentioned. These types of experts tend to have social media literacy or know how to use web-based tools to curate digital content. More specifically, a curation expert may have expertise in identifying reputable sources, knowing how to verify a source, filtering out irrelevant content, or removing spam. Generally, these types of experts are enthusiasts who are passionate about the topic and are resourceful. Since *curation* has become a popularized word in the social web context, particularly as a form of brand marketing, curation enthusiasts are also on the rise and are highly motivated to participate in this process to increase their online influence and social capital.

It is also important to recognize that there is a spectrum of macro to micro forms of curation that is taking place in the social media landscape. On one side of the spectrum, one might view the web as a constantly growing archive with Google engaging in macro-curation. On the other side of the spectrum, Flickr groups could be considered an archive of photos where Flickr group members engage in micro-curation by using the social features within Flickr. Much of what is taking place through social media is a constant mix of macro and micro curation, which facilitates the cyclical process of curation. It is also worth noting that in the past, it took curators a considerable amount of time to develop exhibits from a collection. However, in the social media landscape, curation is happening at a faster rate because people now have the ability to harness the networking capacities of the internet. Therefore, curation may no longer be a long-term endeavor, as it is becoming increasingly possible to engage in real-time curation, which is of particular value in the context of the real-time web.

Another aspect of socially-distributed curation is the symbiosis between the human and the computer. Drawing from Licklider's (1960) well-known phrase of "Man-Computer

Symbiosis," there is a close partnership between human and algorithmic curation. This may not be a true symbiotic relationship, since computers are not sentient beings that can receive tangible benefits from this relationship. Nevertheless, the point here is that the human and computer algorithms are tightly coupled even though humans depend more on computers to engage in socially-distributed curatorial activities.

As previously mentioned, Jeff Jarvis used the phrase "human-aided algorithmic curation" to describe the connection between human and algorithms. What emerged in my analysis of curatorial activities was a *spectrum between human and algorithmic curation*. **Human-aided algorithmic curation** involves more human discernment in selecting and filtering artifacts that were initially aggregated algorithmically. Twitter falls in this case where most Twitter users carefully select links to share to their social network, but the Twitter user relies on this web service and its algorithms to distribute this information. **Algorithmic-aided human curation** relies more on algorithms to aggregate and filter content, but it still is based on human actions, such as the PageRank algorithm. Some have also argued that it is better to allow algorithmic forms of curation on the input side and not rely solely on algorithms when curating the output. In other words, it is better to use algorithms to aggregate content and then have humans, rather than algorithms, select the content that should appear in a story or an exhibit. It is hard to say which type of curation is better or worse, since people are designing very sophisticated algorithms and curatorial tools will increasingly be needed in the information age.

As a final point, it is important to remember that humans design algorithms, which are often value-laden in some way by biasing the calculation of certain types of data. Therefore, algorithmic curation will always involve a human element in terms of the development of the algorithm and the calculation of online human actions. One cannot ignore the fact that web users

are always relying on algorithms to find content when using search engines, but human discernment should always be the final deciding factor in determining what is worthy of clicking and sharing to preserve and pass on legacies worthy of being remembered for future generations. To some extent, algorithms are being used to augment human curatorial activities in the social web context. For instance, social media users tend to select and view content based on the number of views, ratings, friends, followers, and/or subscribers, all of which are calculated using algorithms and become algorithmic recommendations. The power of the algorithm lies in conducting tasks that humans cannot do manually or would not want to do.

Algorithms are becoming powerful mechanisms to manage and represent the influx of online activities, but it is important to be aware of how these algorithms operate as a reflection of what gets valued as well as devalued. It is tempting to just believe that the algorithms that power many web services that we use today are democratic in their calculations, but we need to be critical of them too and understand the values that are embedded in the design of these web services.

10.5 Epilogue

As an interdisciplinary piece of work, different chapters and sections of this dissertation are intended for particular domains and fields of study. Scholars within the heritage studies domain may gain a deeper understanding of what *living heritage* means in the social media landscape based on the descriptive accounts of historic crises. Scholars from the field of human-computer interaction may benefit from the heritage studies literature and the descriptive examples of living heritage to encourage a more expanded view of digital heritage for technology design purposes. Disaster researchers may benefit from understanding how social media is being used to remember historic crises in the present day. Technology designers,

especially those developing social media services, may benefit from the *theoretical model of socially-distributed curation*, which is intended to provide implications for designing curatorial tools. Social media users and evangelists may benefit from the themes that emerged after critiquing the concept of curation as a profession and as a popularized term in the social web world. Professional curators may benefit from the recently developed interpretations of curation in the social media context and how curation is taking on new meanings in the digital age.

As data is transformed into information and as information is transformed into knowledge, we are beginning to collectively transform this knowledge into wisdom in this participatory age by interpreting and rewriting our stories in a way that is meaningful and relevant to the concerns of today and the potentials of tomorrow.

"…the present generation may rewrite history but it does not write it on a blank page."
– Lewis A. Coser (1992)

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GLOSSARY

Crisis: The term "crisis" is predominantly used in this dissertation to describe large-scale emergency activity that include disasters as well as other kinds of historical, mass-convergence events that exhibit similar behavior by formal emergency responders and members of the public. Personal crises (e.g., a death of a relative, being diagnosed with cancer, being in a car accident, etc.) are outside of the scope of this dissertation; instead, the focus is more on major crises that have affected a community. Although much of the theoretical and practical knowledge cited here comes from literature from disaster research, this dissertation looks more broadly at historic crises.

Grassroots heritage: A bottom-up, participatory process of sharing memories, values, and practices in the form of narratives that are intended to sustain a culture. This sociocultural process is about making meaning and drawing out the values worthy of preserving.

Participatory culture: A culture that supports community involvement, contains relatively low barriers to civic engagement, facilitates sharing, recognizes the contributions of others matter, and encourages social connections.

Pre-web age: I define the "pre-web age" as the period before the web became available in 1993.

Socially-distributed curation: It is a sociotechnical practice involving people, cultural artifacts, and information and communication technology. It consists of seven curatorial activities and explanations of the relationships between these activities.

Social media: Social media is an umbrella term for web services (e.g., blogs, wikis, social networking sites, and media sharing sites) that facilitate ICT-based communication, content sharing, networking and collaboration.

Social media age: I define the "social media age" as the current age and starts when blogging started gaining popularity in 1999, when multiple blogging services (i.e., Live Journal and Blogger) were launched. Although the Open Diary blogging platform was launched in 1998, blogging was not yet popular.

Web age: I define the "web age" as the period between 1993 and before the introduction of social media services.

Web sphere analysis: A web sphere is a multi-dimensional unit of analysis for cybercultural studies. Web sphere analysis is a multi-method, integrative framework for investigating communicative actions and relations between producers and users of web materials over time that consists of a set of dynamically defined digital resources spanning multiple web sites deemed relevant or related to a central event, concept or theme, and often connected by hyperlinks.

APPENDIX A IRB PROTOCOL 0209.33

Grassroots Heritage: A Multi-Method Investigation of How Social Media Sustain the Living Heritage of Historic Crises

1) *Purpose and Significance of the Project. (This should be in terms understandable to knowledgeable laypeople.* ***DO NOT simply cut and paste from grant proposal, or your request may be returned without review.)***

Unprecedented uses of information and communication technology (ICT) and particularly social media (e.g., Wikipedia, Facebook, and Twitter) are occurring in times of crisis. This project investigates the socio-technical practices emerging from the use of social media and how these practices help to sustain the *living heritage* of historic crises. The purpose is to provide empirical evidence on how heritage is a living and participatory phenomenon that needs to be considered when designing technology for heritage matters. The concepts of *grassroots heritage* and *socially-distributed curation* are offered as a way of interpreting cultural heritage in the context of the participatory web.

The purpose of this interdisciplinary dissertation research is to develop a conceptual framework for crisis-related grassroots heritage useful for technology designers. This will include a well-documented approach for how to conduct web-based probes using existing social media to inspire technology design ideas. This research focuses on major crises exhibiting large-scale emergency activity as well as historical, mass-convergence events exhibiting similar behavior (e.g., major natural hazards like hurricanes and wildfires, large-scale crimes or terrorist attacks, the economic crisis, the effects of climate change). The notion of "heritage" in this research is used to understand how memories, artifacts, traditions, and values are publicly shared for the benefit of future generations. Specifically, this study explores how social media technologies have the potential to support new kinds of heritage practices at the grassroots level by being both the tools and the sites for facilitating heritage production and sharing, what I term "grassroots heritage."

The following research questions guide this research study:

Part 1A Research Questions: Are people using social media to digitally commemorate crises? If so, what kinds of crisis commemoration trends are emerging?

Part 1B Research Questions: What kinds of narratives are emerging from social media when crisis remembrance meets social action? Why are people using social media to share crisis memories?

Part 2 Research Questions: What activities are associated with curation? What kind of curation is taking place through social media?

Part 3 Research Question: Did the curation activities defined in Part 2 occur for the crisis narratives found in Part 1?

One goal of this research study is to begin generating design ideas for next generation social media tools. These tools will support socially distributed curation of public-generated content around crises as well as support social action to strengthen community resilience to crises. These design ideas will inform the development of the conceptual framework for grassroots heritage practices around crisis-related memories. I will also present design principles to guide future developments of social technologies that support crisis-related heritage practices. Furthermore, this research strongly focuses on using empathic and reflective design approaches to better understand and emphasize the cultural implications of these technology design ideas.

2) *Methodology of the project (again in lay terms; DO NOT simply cut and paste from grant proposal.)*

a) *General description of the structure of the project*

My previous empirical research studies relevant to this dissertation research took place between August 2005 and December 2008. These research studies were conducted under the guidance of Assistant Professor Leysia Palen, which had prior HRC approval under HRC Protocols 0407.15 and 0905.13.

This project involves a multi-method investigation to determine what crisis narratives appeared in social media and how social media were used to sustain these narratives through curatorial activities. The first study surveys the social media presence of 111 crisis events that occurred between 1960 and 2010 to examine if and how past historically significant crisis events were being commemorated in the present day through new media. Then, ethnographic and computational methods were used to identify narratives appearing in the social media landscape for four crisis events that exhibited a high social media presence in the survey. The project involves the investigation five meta-narratives for four crises case studies: (1) the 1984 Bhopal gas leak, (2) the 2001 September 11 attacks, (3) the 2005 Hurricane Katrina, and (4) the climate change crisis. A critical finding is that people sustain the heritage of historic crises in the digital world by perpetually revising narratives while adapting these messages to the new media of today. The second study critiques both the concept of "curator" as a profession as well as the concept of "curation" that is emerging from the social web to develop a preliminary curation model. The final study involved the application and critique of this preliminary model by analyzing the curatorial activities that produced a subset of the crisis narratives found in the first study. From this assessment, I articulate a conceptual model called *socially-distributed curation* to inform the design of future social technology.

Aside from my written dissertation document and other research publications, I also plan to use web-based technologies to dynamically display the multimedia content in the design proposals. Much of my design process, the design artifacts generated by the participants, and the final design proposals will be documented using existing social media tools (e.g., blog, media-sharing sites like Flickr and YouTube, social networking sites like Facebook, and the micro-blog site like Twitter). The participants will be asked what level of confidentiality they want to have particularly if I want to use their design artifact for publication purposes. Therefore, not all the multimedia content generated in this research study will be displayed publicly online or in research publications.

b) *Please list the Key Personnel of this research project. (Key Personnel are individuals, including the principal investigator and collaborators, who contribute in a substantive way to the scientific development or execution of a project, whether or not they receive compensation from the grant supporting that project.)*

Sophia B. Liu is the Key Personnel and the Principal Investigator of this research project since this is her dissertation research project. Ms. Liu is a fourth year Ph.D. Candidate in the ATLAS Institute and receives travel, equipment and salary from her NSF Graduate Research Fellowship and Palen's NSF CAREER Grant.

Leysia Palen, Assistant Professor of Computer Science, is Ms. Liu's graduate advisor and receives partial summer salary from her NSF CAREER Grant. Professor Palen will be involved in this research by participating in some data design sessions and co-authoring publications relevant to this research.

Other students in Professor Palen's research lab may be involved in this research study by participating in some technology building activities, data design sessions, and data collection activities. Their participation will primarily focus on developing tools to facilitate my research study. Therefore, they will not need to have access to my participants' data but if they do then this data will be anonymized before they have access to it.

c) *Please list all locations at which the research will take place.*

This research project will largely take place online but will involve remotely recruiting participants who use social media through electronic communication channels.

This research may also take place in the following physical locations within the United States:

- Colorado: Boulder residents affected by the Neva and Old Stage Road fire on January 7-8, 2009; Littleton at Columbine High School and the Columbine Memorial
- Virginia: Blacksburg, Virginia at Virginia Tech
- New York: Manhattan, New York at the WTC memorial site, the Smithsonian's National Museum of American History, the Lower Manhattan StoryBooth, and other sites related to the September 11 attacks
- Louisiana: New Orleans at the Jazz and Heritage Festival in April 2009 and at the Common Ground grassroots organization in the Lower 9th Ward

d) *Description of the subject population including recruitment methods, age, type, and number of participants.* ***Include copies and scripts of advertisements*** *(including Buff Bulletin/campus E-memo notices****). Please note that any additional recruitment procedures would require HRC review as a change request.***

For this research project, I have already started to generate a list of potential participants based on my empirical and design-oriented research over the last three years. For people who I can meet with physically at the field sites listed in the previous section 2c, I will ask them if they would like to participate in person and then have them sign the Informed Consent Form. For potential participants who I cannot logistically meet in person, I plan to privately contact them using electronic messaging services from social media sites or via email (see page 12 for an example of this message). If they agree to participate, then I will send them the consent form electronically and have them either provide an electronic signature or request a waiver of documentation by replying back via an electronic message confirming that they have been informed about the study and are agreeing to participate in the study. Some of these participants may be employees at a particular institution, but my intention is not to intervene during their workday (see 2e for more details).

I also plan to recruit participants at mass-convergence events, such as at festivals, anniversaries around certain crises, and conference-type gatherings. Instead of using the 2-page Informed Consent Form, I will have a shorter version of the consent form to inform the participant and request a waiver of documentation. If the participant would be interested in participating in my research in the long-term, I will obtain contact information to follow-up with them.

The participants in my research study can be categorized as people who have produced crisis-related artifacts using social media, people who exhibit socially distributed curation activities using social media, people who are a part of social action-oriented initiatives relating to cultural heritage, and people in the Y or Net Generation that strongly integrate ancient traditions with current social practices. More specific descriptions of these participants are described below. The participants will primarily be adults (~20 – 50 years old).

I will recruit participants who have generated crisis-related artifacts using social media but who have NOT recently been directly affected by a major crisis and have experienced a tremendous loss. This will include people who are familiar with the 1984 Bhopal gas leak, the 2001 September 11 attacks, the 2005 Hurricane Katrina, and the climate change crisis. I may particularly recruit the creators and contributors of crisis-related archives (i.e. The September 11 Digital Archive, The Hurricane Digital Memory Bank, The April 16 Archive, and the Columbine Memorial) as well as Flickr, YouTube, Facebook, and Twitter users who publicly shared notable or large amounts of crisis-related contributions. I also plan to ask volunteers from specific grassroots organizations that emerged in response to these four crises.

I also was recently affected by a local crisis—the Neva and Olde Stage Road fires in Boulder, Colorado on January 7-8, 2009. During the time I was evacuated, I used Twitter, Facebook, and Flickr to provide updates and upload crisis-related media. Through these social media sites, I made direct connections with people who were evacuated as well as news organizations and members of the public using these social media technologies. I will find local community members in the Boulder area and cultivate a more in-depth, face-to-face interaction with these participants.

I also will ask people who exhibited socially distributed curation activities using social media. In this context, socially distributed curation means people engaging in collecting, organizing, interpreting, and representing crisis-related memories. I plan to recruit the creators of crisis-related Flickr and Facebook groups and people who have used curatorial-like tools for building online collections and sharing digital stories (e.g., YouBundle, Flowgram, Twine, Squidoo, Jumpcut, Skitch, Cozimo).

I also plan to ask the creators and the contributors of social action-oriented websites engaging in initiatives relating to cultural heritage (i.e. StoryCorps, Generation We, 350, Film Your Issue, OnTheCommons, The Culture Project, YouthSpeaks, YouthNoise, Change.org). These sites mainly focus on digital storytelling, facilitating innovative social network-based movements, offering practical solutions to major crises, taking action and sharing it via social media sites, creating and cultivating new cultural paradigms of sustainability and participation, facilitating public dialogue on pressing issues using social media, collating public-generated content on certain issues, and coordinating physical and virtual community events.

Lastly, I will recruit people in the Y or Net Generation that strongly integrate ancient or indigenous traditions with current heritage practices using social technologies. For example, this may include participants who use social media to actively preserve universal or ancient traditions like respecting elders, connecting to nature and its resources, and participating in ancient ceremonial gatherings.

i) Please indicate the number of participants over the life of the project you intend to enroll:*

**Subject enrolled is determined by those who sign consent forms over the life of the project, not by the number of people who complete a study or who meet screening standards that are assessed after signing a consent form. If appropriate, describe any differences between the number you intend to have sign consents and your intended number of final participants after attrition.*

I anticipate that up to 300 people will require signed Informed Consent Forms including those using a waiver of documentation to participate in this research study. These participants may use or incorporate publicly available content from secondary participants. For these cases, appropriate attribution will be ensured when participants use this content publicly.

ii) Please indicate the number of participants expected to complete the research over the life of the project:

I expect to obtain signed consent from approximately 300 people over the life of this research project. I anticipate that half will be deeply participating possibly over a few months, while the other half may participate for a shorter duration possibly on a one-time basis.

e) Description of the procedures involving human subjects (including procedures which may be deceptive, embarrassing, or discomforting to participants). Describe what the participant will encounter: when, where, and how long. If deception is to be used, attach a copy of the debriefing form or statement.

For the participants that I recruit at mass-convergence events where I request a waiver of documentation, I will give them quick probe activities. For example, I plan to give participants at the Jazz Fest in New Orleans postcards asking them to write to their future generations about what they want them to know about Jazz Fest, New Orleans, and the impact of Hurricane Katrina (see page 24). I also plan to collect oral stories using the same questions for participants who would rather talk about it as opposed to write about it. I will ask participants to not use names or any other identifier information when I am audio recording these oral stories. However, if they would be interested in participating in my research in the long-term, I will obtain their contact information, give them the 2-page Informed Consent Form, and follow-up with them at the most three times by calling them, emailing them, and calling them one last time during a reasonable time during the day or early evening.

For the participants who agree upfront to participate in my research in the long term, the design study will be conducted in different stages with each participant. Participants will be asked to participate in an informal interview (30 to 90 minutes) over the phone, email, or other mode of communication that best fits the participant. Participants will be asked questions about your social media use and how it relates to heritage practices in the context of past major crises. The time commitment to participate in this study will vary depending on your availability. Examples of these interview questions are on page 12. The interviews will not be done during an employee's workday unless they agree to do so. If this does occur, I will obtain a Letter of Agreement from their institution first.

*f) Description of any surveys, questionnaires or interview schedules to be used **(copies must be attached)***

Within each social media service, participants who exhibited relevant activity (i.e., digital traces of crisis remembrance and social action activities) on Facebook, Flickr, YouTube, Twitter, Wikipedia, and blogs will be recruited. Within each of the social media services, social media metrics (i.e., top contributors, recent and most viewed photo/video, etc.) will be used to narrow down my list of potential participants and then contact those that provided contact information.

For Facebook, group administrators for the top three Facebook groups that had the highest number of members for each crisis, people that created a high volume of digital traces within Facebook groups, and the top recruiters for Facebook causes will be contacted. For Flickr, group administrators for the top Flickr group that had the highest number of photos for each crisis, the top three contributors of that group, and Flickr users that uploaded pertinent photos will be contacted. For YouTube, the creators of the top five "most viewed" YouTube videos for each crisis will be contacted. For Twitter, Twitter users that created tweets relevant to the crisis narratives I found for each crisis event will be contacted. For Wikipedia, top contributors of the Wikipedia articles associated with each crisis will be contacted. For blogs, Google Blog Search will be used and bloggers that wrote blog posts related to remembrance and social action specific to each crisis will be contacted.

The length of the interviews will vary with each participant. Some may be short-term (e.g., one-time interactions), while others may be long-term (e.g., the longest being 15 months). Both synchronous and asynchronous communication media will be used to interview each participant (e.g., email; phone; private messaging services within Facebook, Flickr, YouTube, and Twitter; Skype's videoconferencing feature; instant messaging/chat service; and face-to-face). Participants wil be asked to sign a Participant Informed Consent Form (Appendix A) or confirm that they agree to participate in my research study if obtaining a physical signature would be too inconvenient by using a waiver of written consent (Appendix B). The form also asks participants to specify what type of recording (i.e., audio, photo, or video recording) they will allow during the interview; however, this excludes email interviews since participants write their responses and are thus recorded textually. The form also asks if they will allow their data to be published in research publications or publicly shared online, and if they will like their names disclosed. I expect that many will *not* want to be anonymous as a function of maintaining their public personas.

3) *Description of the risks and benefits to participants*

   a) *Any risks to the participants should be described*

   Although the investigator does not foresee any associated risks by taking part in this study, the participant may find that she or he could be uncomfortable re-visiting memories or seeing photos from a certain event.

   b) *Benefits include any benefits that the participant may encounter for participation, as well as the benefit to society or science in conducting such research. Benefits should not be overstated; it is acceptable to indicate that "There are no direct benefits for participating in this study."*

   Generally, there are no direct benefits for participating in this study. However, there may be some instances where I will offer participants a small gift never amounting over $5, such as a planting seed, a drink, or a snack. Still, the participants may indirectly benefit based on the knowledge they share and learn from this study. This research examines current social and cultural practices around crises and will result in design implications for next generation social media. Therefore, participants may benefit from this research through their contributions to the design ideas developed for this research project.

4) *Description of means for ensuring privacy for participants (including a statement of either confidentiality or anonymity; if you intend to audio- or video-tape participants, describe final disposition of the tapes [e.g., erased, destroyed, given to participants; if retained, explain how long and how confidentiality will be maintained]. If DNA is collected, indicate the specific use to which it will be put, how confidentiality will be protected, and how long the material will be retained.*

Throughout the duration of the study, participants will be asked if the interviews can be recorded using different media. For the informal interview, participants will be audio or video recorded with their permission but no identifying information will be recorded on the device. Participants will have the option to turn off any recording devices, delete certain segments with sensitive information, or delete/destroy any physical or digital materials at any time. The participants can make their data only privately viewed by me. Or they could make it anonymous or use pseudonyms but still have it publicly available online. The participants may also choose to share them publicly with their identification information (particularly if they think it will help promote their own work). For research publications and presentations, the participants will also have the option to have their artifact presented with their name, a pseudonym, no name, or not have them be published in these venues at all.

I also plan to create password protected social media accounts specific to this research study. Participants will have the option to use these accounts as opposed to their personal social media accounts in order to publicly share their design artifacts but in an anonymous way. Participants may also share crisis-related digital artifacts that they generated, received, or found. If identification information of secondary participants appears in these artifacts, they will be removed or given appropriate attribution accordingly. Generally, the participants will remain anonymous in the analysis and presentation of the results, unless participants state otherwise. The multimedia recordings and digital artifacts produced by the participants will be password protected on my laptop, external hard drives, and relevant websites, unless the participants state otherwise. The digital documents will be deleted, and physical documents will be destroyed at the end of my dissertation project (~ May 2012).

The following statements have been included in the 2-page Informed Consent Form:

Confidentiality*: I will maintain the privacy of your data, unless you state otherwise. Your voice and other sensitive identification information may be recognizable in audio and video recordings; therefore, I will use digital techniques to obscure this information and address any other concerns you may have. If this is not acceptable, then we will NOT use the excerpt. Data will be kept secured. If you object to any of these stipulations or require further specifications, please detail this below and we will follow your request. Other than Sophia B. Liu and Professor Leysia Palen, only regulatory agencies such as the Office of Human Research Protections and the University of Colorado Human Research Committee may see your individual data as part of routine audits.*

For the quick probe activities, I will give participants a shorter version of the Informed Consent Form. The following statements have been included in the short Informed Consent Form:

Confidentiality*: The information you provide may be publicly shown as part of a larger collection directed towards future generations as well as for research presentations and publications. However, you may choose to have your information only be used internally for research purposes and not have it publicly available. If you are participating in this study just this one time, you will remain anonymous. If you decide to participate in this study in the long-term I will obtain your contact information, give you the 2-page Informed Consent Form, and follow-up with you no more than three times. Your voice and other sensitive identification information may be recognizable in audio and video recordings; therefore, we can obscure this information and address any other concerns you may have. Data will be kept secured and destroyed by March 2012 unless you state otherwise. If you object to any of these stipulations or require further specifications, please contact Sophia B. Liu and we will follow your request. Regulatory agencies such as the Office of Human Research Protections and the University of Colorado Human Research Committee may see your individual data as part of routine audits.*

5) Investigator's qualifications to conduct the study (attach CV, or describe qualifications).

I conducted empirical research over the past six years during my doctoral degree under Assistant Professor Leysia Palen's approved research studies. I also have received training in conducting ethnographic fieldwork and I have participated in research projects as a research assistant at my undergraduate and graduate institutions. For example, I was a research assistant at the Natural Hazards Center and participated in research projects funded and approved by this center. During my undergraduate degree, I conducted an Honors Thesis on the use of instant messaging at University of California, Irvine with IRB approval.

Please see the attached Curriculum Vitae (CV) on page 14.

6) *Attach consent form(s). Written informed consent documents are required by the HRC for review and approval for participants in protocols that are considered regular or expeditable. If the protocol qualifies for an exempt review, but includes video and/or audio taping, a written consent document is required; in most other cases, verbal consent is required. If your participants include persons aged 7-14, you must provide a written assent form with simplified language to be signed by these participants, as well as a parental permission form to be signed by the parent/guardian. Participants aged 15-17 normally may sign a written assent form in the same language used in the permission form provided to their parents. Please include protocol title, PI name, date, and page numbers on the consent forms. (For help, see the sample consent and assent forms, and instructions, on the HRC web site.)*

Please see the attached 2-page "Informed Consent Form" and the short Informed Consent Form that allows a waiver of documentation for more details.

7) ***For funded projects, provide a copy of the contract/grant proposal with this completed application.***

Please see the attached NSF Graduate Research Fellowship proposal awarded to Ms. Liu page 22.

Please see the physical copy of the NSF CAREER Grant proposal awarded to Professor Palen.

Please note that this proposal was written in 2005 before Hurricane Katrina, so some of the details in regards to the current diffusion of technology have changed. In this proposal, I highlight the sections that are most relevant to this research study, namely the citizen-side activities.

EXAMPLE OF A MESSAGE TO POTENTIAL PARTICIPANTS VIA EMAIL OR SOCIAL MEDIA MESSAGING SERVICES

Dear <Potential Participant>,

I am a graduate student in an interdisciplinary PhD program at the Alliance for Technology, Learning and Society Institute at University of Colorado at Boulder. I was wondering if you would be interested in participating in my research study related to these types of crisis-related activities you engaged in. The purpose of this research is to inform the design of next generation social media tools that support crisis-related heritage practices. This research will also explore how members of the public are actively participating in crisis-related efforts and design social media tools that support social action to strengthen community resilience to crises.

I am contacting you because you have exhibited crisis-related activities relevant to my research. <Describe specific relevant activities that the participant engaged in and made publicly available.>

If you are interested in participating in this research study, please contact me via email (Sophia.Liu@colorado.edu) or by phone (630 729 4216). Any information you provide will remain confidential.

With sincere thanks,

Sophia Liu
Ph.D. Candidate
http://sophiabliu.com
Sophia.Liu@colorado.edu

APPENDIX B INFORMED CONSENT FORMS

Grassroots Heritage: A Multi-Method Investigation of How Social Media Sustain the Living Heritage of Historic Crises

Principal Investigator (PI) Sophia B. Liu

PARTICIPANT INFORMED CONSENT FORM

March 21, 2011

Please read the following material that explains this research study. Signing this form will indicate that you have been informed about the study and that you want to participate. We want you to understand what you are being asked to do and what risks and benefits—if any—are associated with the study. This should help you decide whether or not you want to participate in the study.

You are being asked to take part in a research project conducted by Sophia B. Liu, a graduate student in the Alliance for Technology, Learning and Society (ATLAS) Institute located at University of Colorado at Boulder, 320 UCB, Boulder, CO 80309-0320. This project is being conducted under the direction of Professor Leysia Palen, Department of Computer Science, 430 UCB.
Sophia B. Liu can be reached by phone at (630) 729-4216 and by email at Sophia.Liu@colorado.edu.

Project Description: This research project investigates the emerging heritage practices forming from the use of social media technology around crisis situations by members of the public, what I call *grassroots heritage*. The goal of this project is to obtain empirical evidence of how people are using social media to sustain the living heritage of historic crises through curation activities. This project uses ethnographic and computational methods to collect and analyze artifacts from social media services. This includes interviewing social media users and other relevant stakeholders to understand why and how they are using social media to share memories and narratives about historic crises. Participation in this study is entirely voluntary. Approximately 100 participants will be invited to participate in this research study.

Procedures: If you agree to take part in this study, you will be asked to participate in a 30 to 90-minute informal interview over the phone, email, or other mode of communication that best fits the participant. The investigator will ask questions about your social media use and how it relates to heritage practices in the context of past major crises. The time commitment to participate in this study will vary depending on your availability. Participation may take place remotely or in-person at convenient or relevant locations. You have the right to withdraw your consent or stop participating at any time. You also have the right to refuse to answer any question(s) or to participate in any procedure for any reason. Participation in this research may include different forms of recording (e.g., audio, video, photo, screenshots, or screencasts) but it is not a requirement for participation. You may indicate any type of recording device you do NOT want to have on during your participation. These recordings will be password protected and will only be seen by the Principal Investigator and Professor Palen, unless you state otherwise. Digital documents will be deleted, and physical documents will be destroyed at the end of this research (March 2012), unless you state otherwise.

Risks and Benefits:
Although the investigator does not foresee any associated risks by taking part in this study, the participant may find that she or he could be uncomfortable re-visiting memories or seeing photos from a major crisis or focusing event. There are no direct benefits for taking part in this study; however, there may be instances where I will offer you a small gift for your participation.

Source of Funding: The National Science Foundation is the source of funding for this research project. This is funded by a federal agency that requires that data be collected in a form that permits for differences between men and women and races or ethnic groups to be analyzed.

Confidentiality: I will maintain the privacy of your data, unless you state otherwise. Your voice and other sensitive identification information may be recognizable in audio and video recordings; therefore, I will use digital techniques to obscure this information and address any other concerns you may have. If this is not acceptable, then we will NOT use the excerpt. Data will be kept secured. If you object to any of these stipulations or require further specifications, please detail this below and we will follow your request. Other than Sophia B. Liu and Professor Leysia Palen, only regulatory agencies such as the Office of Human Research Protections and the University of Colorado Human Research Committee may see your individual data as part of routine audits.

Invitation for Questions: If you have questions regarding your rights as a participant, any concerns regarding this project or any dissatisfaction with any aspect of this study, you may report them—confidentially, if you wish—to the Institutional Review Board, 3100 Marine Street, Rm A15, 563 UCB, (303) 735-3702.

Please mark the type of recording devices you permit me to use during the research study:

- ➤ I agree ____ to be audio-recorded, ____ to be video-recorded, or ____ to be photographed.
- ➤ I do NOT agree ____ to be audio-recorded, ____ to be video-recorded, or ____ to be photographed.

(If you wish, the Investigator will edit these recordings so that your identity will not be revealed.)

Authorization: I have read this paper about the study or it was read to me. I know the possible risks and benefits. I know that being in this study is voluntary. I choose to be in this study. I know that I can withdraw at any time. I have received, on the date signed, a copy of this document containing 2 pages.

Name of Participant (printed) _____

Signature of Participant _____ Date _____

(Also initial all previous pages of the consent form)

[Note: If you received this form electronically, you can either provide an electronic signature or request a waiver of documentation by replying back via electronic mail confirming that you have read this document and agree to participate in the study. Please also indicate your answers to the above choices.]

Grassroots Heritage: A Multi-Method Investigation of How Social Media Sustain the Living Heritage of Historic Crises
PARTICIPANT INFORMED CONSENT FORM – March 21, 2011

You are being asked to take part in a research project conducted by Principal Investigator (PI) Sophia B. Liu, a graduate student in the University of Colorado at Boulder's connectivIT Lab, 430 UCB, Boulder, CO 80309-0430. **Sophia B. Liu can be reached by cell phone at (630) 729-4216 and by email at Sophia.Liu@colorado.edu.**

Project Description: This research project investigates the emerging heritage practices forming from the use of social media technology around crisis situations by members of the public, what I call *grassroots heritage*. The goal of this project is to obtain empirical evidence of how people are using social media to sustain the living heritage of historic crises through curation activities. This project uses ethnographic and computational methods to collect and analyze artifacts from social media services. This includes interviewing social media users and other relevant stakeholders to understand why and how they are using social media to share memories and narratives about historic crises. Participation in this study is entirely voluntary. Approximately 100 participants will be invited to participate in this research study.

Procedures: If you agree to take part in this study, you will be asked to share your story about a particular crisis, to answer questions about your heritage values and curatorial practices, and/or to describe your visions of a future using social media in the crisis context. You have the right to refuse to answer any question(s) or participate for any reason. Participation in this research may include different forms of recording (e.g., audio, video, photo, screen recording) but it is not a requirement for participation. You may request any type of recording device you do NOT want to have on during your participation. These recordings will be password protected and will only be seen by the PI and her advisor, unless you state otherwise. Digital documents will be deleted, and physical documents will be destroyed at the end of this research (March 2012), unless you state otherwise.

Risks and Benefits: Although the PI does not foresee any associated risks by taking part in this study, the participant may find that she or he could be uncomfortable re-visiting memories from a major crisis. There are no direct benefits for taking part in this study. There may be instances where I will offer you a small gift for your participation.

Source of Funding: The National Science Foundation

Confidentiality: The information you provide may be publicly shown as part of a larger collection directed towards future generations as well as for research presentations and publications. However, you may choose to have your information only be used internally for research purposes and not have it publicly available. If you are participating in this study just this one time, you will remain anonymous. If you decide to participate in this study in the long-term I will obtain your contact information, give you the 2-page Informed Consent Form, and follow-up with you no more than three times. Your voice and other sensitive identification information may be recognizable in audio and video recordings; therefore, we can obscure this information and address any other concerns you may have. Data will be kept secured and destroyed by March 2012 unless you state otherwise. If you object to any of these stipulations or require further specifications, please contact Sophia B. Liu and we will follow your request. Regulatory agencies such as the Office of Human Research Protections and the University of Colorado Human Research Committee may see your individual data as part of routine audits.

Invitation for Questions: If you have questions regarding your rights as a participant, any concerns regarding this project or any dissatisfaction with any aspect of this study, you may report them—confidentially, if you wish—to the Institutional Review Board, 3100 Marine Street, Rm A15, 563 UCB, (303) 735-3702.

Authorization: This Informed Consent Form is to inform you about this research project. This form does not require a signature but instead requires verbal consent to participate in this study. Your consent confirms that you are aware that this is a voluntary study as well as the possible risks and benefits for participating in this study.

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CURRICULUM VITAE

Sophia B. Liu

EDUCATION

University of Colorado at Boulder (CU-Boulder) (August 2005 – Expected in May 2011)
Doctor of Philosophy (Ph.D.) Candidate: *Technology, Media and Society* interdisciplinary program
Alliance for Technology, Learning and Society (ATLAS) Institute
Graduate Advisor: Professor Leysia Palen, Department of Computer Science
Dissertation Title: "Grassroots Heritage: A Multi-Method Investigation of How Social Media Sustains the Living Heritage of Historic Crises"

University of California at Irvine (UC-Irvine) (September 2000 – September 2004)
Bachelors of Arts (B.A.): *Social Science* major specializing in *Research and Analytical Methods*
Double Minors: *Information and Computer Science*; *Digital Arts*
Honors Thesis: "You've Got IM: Instantaneous Communication Among University Students"

University of Sussex, UK (September 2003 – June 2004)
Education Abroad Program (EAP): Took courses in Geography and Cultural Studies

FELLOWSHIP, AWARDS, AND HONORS

National Science Foundation (June 2007 – June 2010)
Awarded the National Science Foundation (NSF) Graduate Research Fellowship in May 2006
Research proposal entitled "Public Expressions: Peer-to-Peer Communications in Response to Crises"

Best Student Paper Award for Information Systems for Crisis Response and Management Conference (May 2008)
Received the Mike Meleshkin Award for Best Student Paper tied for three co-authored papers (see Publications list)

University of California at Irvine (September 2000 – June 2004)
Graduated with a *Magna Cum Laude* award and on the *Dean's Honor List* for all quarters at UC-Irvine
Accepted into the *Social Sciences Honors Program* and the *Undergraduate Research Opportunities Program* (UROP)

RESEARCH INTERESTS AND EXPERTISE

Interdisciplinary Background: Social science (geography, sociology, communication, journalism); Computer science (human-centered computing, science and technology studies, information science); Hazards and disaster research (crisis informatics, crisis mapping, sociology and cultural anthropology of disasters); Digital media arts

Human-Centered Computing: Conducting research in Human-Computer Interaction (HCI), Computer-Supported Cooperative Work (CSCW) and Information Science to understand sociotechnical systems as well as the social and behavioral uses of information & communication technology (ICT); Computer-Mediated Communication (CMC), social computing, Web 2.0, social media, web mashups, geospatial web, neogeography, crowdsourcing

Crisis Informatics: Integrating the technical, social and informational aspects of crisis; conducting Quick Response Research; collecting social media metrics for 111 disasters; crisis mapping via spatiotemporal interfaces

Cultural Heritage Informatics: Linking digital memory research to digital heritage research, reframing heritage as social action, bridging art and science through curation, offering a "socially-distributed curation" framework

Research Methods: Ethnographic methods, virtual methods, participatory design, cultural probes, reflective design, value-sensitive design, social media metrics, analysis of large datasets through data visualizations

PROFESSIONAL RESEARCH EXPERIENCE

Project EPIC and Connectivity Lab at University of Colorado, Boulder (January 2007 – Present)
Graduate Research Assistant for Professor Leysia Palen conducting research in the area of Crisis Informatics
Funded by an NSF Career Grant on *Data in Disaster: Socio-technical Change in Response Agency and Public Communications* & a multi-disciplinary, multi-university and multi-lingual $2.8M NSF Grant on *Widescale Computer-Mediated Communication in Crisis Response: Roles, Trust & Accuracy in the Social Distribution of Information*

Natural Hazards Center at University of Colorado, Boulder (August 2005 – December 2006)
Graduate Research Assistant at the Natural Hazards Center for Professor Kathleen Tierney in the *Responding to Crises and Unexpected Events – Information Technology Research (RESCUE-ITR)* project working with computer scientists, engineers, social scientists & disaster experts to investigate technological innovations for crisis response

IBM Almaden Research Center, San Jose, CA (June 2005 – August 2005)
Summer Intern for Dr. John Tang at the User Sciences and Experience Research (USER) group collecting field data on computer-mediated interaction among distributed teams using screen-recording software

University of California at Irvine (June 2003 – August 2003)
Undergraduate Research Assistant for Professor Paul Dourish at the School of Information and Computer Sciences
Conducted research on the use of instant messaging and conducted ethnographic research in a medical setting

PROFESSIONAL WORKSHOPS, SEMINARS, AND SUMMER SCHOOLS ATTENDED

Visualizing and Communicating Disaster Professional Seminar (August – December 2010)
Invited to participate in the Visual Arts / Visual Science seminar, moderated by Professor Diane Sieber
Participants included CU faculty and graduate students in arts, humanities, engineering, and social and natural science

Third Summer Research Institute for the Science of Sociotechnical Systems, Stevenson, WA (June 13 – 17, 2010)
Invited to participate in the Consortium for the Science of Sociotechnical Systems (CSST) Research Institute

NSF Communicating Science: Tools for Scientists and Engineers Workshop, Boulder, CO (April 29, 2010)
Attended workshop hosted by American Association for the Advancement of Science (AAAS) and National Science Foundation (NSF) at University Corporation for Atmospheric Research (UCAR), Boulder, CO

NSF Cyberinfrastructure Resources Workshop, Boulder, CO (October 17, 2007)
Invited to a workshop for National Science Foundation (NSF) Graduate Research Fellows that took place on the Access Grid at the National Center for Atmospheric Research (NCAR), Boulder, CO

First ISCRAM-TIEMS Summer School, Tilburg, Netherlands (June 14 – 22, 2006)
Attended the first Information Systems for Crisis Response and Management – The International Emergency Management Society (ISCRAM–TIEMS) Summer School at Tilburg University

2006 Workshop on Customized Information Dissemination for Real-Time Seismic Alerts (May 26, 2006)
Organized and attended a workshop for engineers, earth scientists, social scientists, computer scientists, policy experts, private organizations and potential consumers of earthquake alerts to discuss the technological and social issues of rapid information dissemination of seismic alerts in the greater Los Angeles, California area

2006 Annual Flood Exercise in Boulder, CO (April 18, 2006)
Invited to participate in the City of Boulder's annual flood exercise at the CU-Boulder's Emergency Operation Center (EOC) demonstrating the sources of data used by local responders to make decisions about flood risk

TEACHING EXPERIENCE

Instructor for Technology, Arts and Media (TAM) at the ATLAS Institute (May 2011 – July 2011)
Social Media for Social Good During Crises undergraduate level course

Teaching Assistant in Computer Science (January 2011 – May 2011)
Human Computer Interaction: Survey and Synthesis graduate level course taught by Professor Leysia Palen

Co-Leading ATLAS PhD Seminar (January 2011 – May 2011)

PUBLICATIONS

REFEREED JOURNAL ARTICLES

Liu, Sophia B. and Leysia Palen. (2010). **The New Cartographers: Crisis Map Mashups and the Emergence of Neogeographic Practice**. *Cartography and Geographic Information Science (CaGIS) Journal*, Special Issue: New Directions in Hazards and Disaster Research, 37 (1), pp. 69-90.

Palen, Leysia, Sarah Vieweg, Sophia B. Liu, and Amanda Hughes. (2009). **Crisis in a Networked World: Features of Computer-Mediated Communication in the April 16, 2007 Virginia Tech Event**. *Social Science Computer Review*, Special Issue: e-Social Science, Sage, 27 (4), pp. 467-480.

Palen, Leysia, Starr Roxanne Hiltz, and Sophia B. Liu (2007). **Online Forums Supporting Grassroots Participation in Emergency Preparedness and Response.** *Communications of the Association of Computing Machinery (CACM)*, 50 (3), pp. 54-58.

HIGHLY COMPETITIVE CONFERENCE PUBLICATIONS, REVIEWED IN FULL

Palen, Leysia and Sophia B. Liu (2007). **Citizen Communications in Crisis: Anticipating a Future of ICT-Supported Participation**. *Proceedings of the 25th ACM Conference on Human Factors in Computing Systems (CHI 2007)*, San Jose, CA, pp. 727-736. **(25% acceptance rate)**

Tang, John, Sophia B. Liu, Michael Muller, James Lin, and Clemens Drews. (2006). **Unobtrusive but Invasive: Using Screen Recording to Collect Field Data on Computer-Mediated Interaction**. *Proceedings of the 20th ACM Conference on Computer-Supported Cooperative Work (CSCW 2006)*, Banff, Alberta, Canada, pp. 479-482. **(20% acceptance rate)**

OTHER REFEREED CONFERENCE PUBLICATIONS, REVIEWED IN FULL

Liu, Sophia B. and Brad King. (2010). **The Search for Meaning in Distributed Story Streams**. Presented at the *Popular Culture Association /American Culture Association National Conference (PCA/ACA 2010)*, Memory and Representation subject area, St. Louis, MO. (10 pages).

Liu, Sophia B. and Leysia Palen. (2009). **Spatiotemporal Mashups: A Survey of Current Tools to Inform Next Generation Crisis Support Tools**. *Proceedings of the 6th International Conference on Information Systems for Crisis Response and Management (ISCRAM 2009)*, J. Landgren & S. Jul (Eds.), Gothenburg, Sweden. (Online proceedings, 12 pages).

Liu, Sophia B., Leysia Palen, Jeannette Sutton, Amanda Hughes, and Sarah Vieweg. (2008). **In Search of the Bigger Picture: The Emergent Role of On-Line Photo Sharing in Times of Disaster**. *Proceedings of the 5th International Conference on Information Systems for Crisis Response and Management (ISCRAM 2008)*, Washington, DC, pp. 140-149. ***Tied for Best Student Paper award****

Hughes, Amanda L., Leysia Palen, Jeannette Sutton, Sophia B. Liu, and Sarah Vieweg. (2008). **"Site-Seeing" in Disaster: An Examination of On-Line Social Convergence**. *Proceedings of the 5th International Conference on Information Systems for Crisis Response and Management (ISCRAM 2008)*, Washington, DC, pp. 324-333. ***Tied for Best Student Paper award****

Vieweg, Sarah, Leysia Palen, Sophia B. Liu, Amanda Hughes, Sarah Vieweg, and Jeannette Sutton. (2008). **Collective Intelligence in Disaster: Examination of the Phenomenon in the Aftermath of the 2007 Virginia Tech Shootings**. *Proceedings of the 5th International Conference on Information Systems for Crisis Response and Management (ISCRAM 2008)*, Washington, DC, pp. 44-54. ***Tied for Best Student Paper award****

Palen, Leysia, Sarah Vieweg, Jeannette Sutton, Sophia B. Liu, and Amanda Hughes. (2007). **Crisis Informatics: Studying Crisis in a Networked World**. *Proceedings of the 3rd International Conference on E-Social Science*, Ann Arbor, MI, Oct 7-9, 2007. (Online proceedings; 10 pages)

Bevc, Christine A., Carter T. Butts, Benjamin E. Lind, Sophia B. Liu, Miruna Petrescu-Prahova, Jeannette Sutton, and Kathleen Tierney. (2006). **Predictors of Dyadic Interaction in Emergent Multiorganizational Networks Following the World Trade Center Attacks**. Paper presented at *the XXVI International Sunbelt Social Network Conference of the International Network for Social Network Analysis*, Vancouver, Canada.

INVITED ONLINE JOURNAL ARTICLE

Liu, Sophia B. (2010). **Trends in Distributed Curatorial Technology to Manage Data in a Networked World**. *UPGRADE Journal: 2010 - Emerging Information Technologies (II)*, Vol XI, Num 3, pp. 18-24.

BOOK CHAPTERS

Liu, Sophia B. and Jen Ziemke. (Forthcoming). **From Cultures of Participation to the Rise of Crisis Mapping in a Networked World**. In Aaron Delwiche and Jennifer Henderson (Eds.), *The Routledge Handbook of Participatory Cultures*, New York: Routledge.

Liu, Sophia B., Leysia Palen, and Elisa Giaccardi. (Forthcoming). **Heritage Matters in Crisis Informatics: How Information and Communication Technology Can Support Legacies of Crisis Events**. In Christine Hagar (Ed.), *Crisis Information Management: Communication and Technologies*, Cambridge, UK: Woodhead Publishing Limited.

Starbird, Kate, Leysia Palen, Sophia B. Liu, and others. (Forthcoming). **Promoting Structured Data in Citizen Communications During Disaster Response: An Account of Strategies for Diffusion of the 'Tweak the Tweet' Syntax**. In Christine Hagar (Ed.), *Crisis Information Management: Communication and Technologies*, Cambridge, UK: Woodhead Publishing Limited.

Liu, Sophia B. (Forthcoming). **Socially Distributed Curation: Informing Next Generation Social Media to Support Grassroots Heritage Practices**. In Elisa Giaccardi (Ed.), *Heritage 2.0: Understanding and Experiencing Heritage Through Social Media*, Cambridge, UK: Woodhead Publishing Limited.

Liu, Sophia B., Leysia Palen, Jeannette Sutton, Amanda Hughes, and Sarah Vieweg. (2009). **Citizen Photojournalism During Crisis Events**. In Stuart Allan and Einar Thorsen (Eds.), *Citizen Journalism: Global Perspectives*, New York: Peter Lang, pp. 43-64.

MAGAZINE ARTICLES

Liu, Sophia B., Anahi Ayala Iacucci and Patrick Meier. (2010). **Ushahidi Haiti and Chile: Next Generation Crisis Mapping**. *American Congress on Surveying and Mapping (ACSM) Bulletin*, August, pp. 10-13.

Liu, Sophia B and Anahi Ayala Iacucci. (2010). **Crisis Map Mashups in a Participatory Age**. *American Congress on Surveying and Mapping (ACSM) Bulletin*, June, pp. 10-14.

DOCTORAL CONSORTIUM PAPERS, SHORT TALKS AND ARTICLES, WORKSHOP PAPERS, POSTERS

Liu, Sophia B. (Forthcoming). **Digital Commemoration: Surveying the Social Media Revival of Historical Crises**. *Proceedings of the 29th ACM SIGCHI Conference Extended Abstracts on Human Factors in Computing Systems for Student Research Competition (CHI EA 2011)*, Vancouver, Canada. **(33% acceptance rate)**

Liu, Sophia B. (2010). **Crisis Culture Curation**. Presented at the 2nd Annual International Conference on Crisis Mapping (ICCM 2010). Ignite talk: http://bit.ly/CrisisCultureCuration

Liu, Sophia B. (2010). **The Rise of Curated Crisis Content**. *Proceedings of the 7th International Information Systems for Crisis Response and Management (ISCRAM 2010) Conference*, Seattle, WA.
(5-page short paper: http://scr.bi/CuratedCrisisContent; Video: http://bit.ly/CurationVimeo).

Liu, Sophia B. (2010). **Grassroots Heritage in the Crisis Context: A Social Media Probes Approach to Studying Heritage in a Participatory Age**. *Proceedings of the 28th ACM SIGCHI Conference Extended Abstracts on Human Factors in Computing Systems Doctoral Consortium (CHI EA 2010)*, Atlanta, Georgia, pp. 2975-2978.
(26% acceptance rate)

Liu, Sophia B. (2010). **The Emerging Ethics of Studying Social Media Use with a Heritage Twist**. "Revisiting Research Ethics in the Facebook Era: Challenges in Emerging CSCW Research." Workshop at the *ACM Conference on Computer-Supported Cooperative Work (CSCW 2010)*, Savannah, GA.

Liu, Sophia B. (2010). **The Living Heritage in the Age of Social Media**. "Death and the Digital" Workshop at the *ACM Conference on Computer-Supported Cooperative Work (CSCW 2010)*, Savannah, GA.

Liu, Sophia B. (2009). **Drawing Inspiration from Spatiotemporal Crisis Mashups for the Hazards Community**. Presented at the 6th *International Research Committee on Disasters (IRCD) Researchers Meeting*, Broomfield, CO.

Liu, Sophia B. (2009). **Informing the Design of Next Generation Social Media to Support Crisis-Related Grassroots Heritage**. *Proceedings of the 6th International Information Systems for Crisis Response and Management (ISCRAM 2009) Doctoral Consortium*, Gothenburg, Sweden.

Liu, Sophia B. (2008). **Grassroots Heritage: Designing Social Media to Support Civic Curation**. "Tinkering, Tailoring, & Mashing: The Social and Collaborative Practices of the Read-Write Web" Workshop at the *Conference on Computer-Supported Cooperative Work (CSCW 2008)*, San Diego, CA.

Liu, Sophia B. (2008). **On-Line Photo Sharing in Times of Disaster: Going from Study to Design**. Presented at the *First Colorado Celebration of Women in Computing*, Boulder, CO.

Sutton, Jeannette, Leysia Palen, and Sophia B. Liu. (2007). **Studying Disaster in a Networked World: How Expanding Scale, Technology & Attention Challenge Empirical Study**. Presented at the *4th Hazards and Disasters Researchers Meeting (HDRM)*, Broomfield, CO.

Bevc, Christine A., Carter T. Butts, Ben Lind, Sophia B. Liu, Miruna Petrescu-Prahova, Lorien Jasny, Jeannette Sutton, and Kathleen Tierney. (2006). **Emergent Multiorganizational Networks following the World Trade Center Attacks**. Poster presented at the *Annual All-Hands Meeting of Responding to Crises and Unexpected Events – Information Technology Research (RESCUE-ITR)*, San Diego, CA.

INVITED TALKS AND GUEST LECTURES

The Crowd School, Spokane, WA (March 19, 2011)
Invited talk entitled "Crowdsourced Curation for Emergency Management" at an event called The Crowd School

Technology4Good BarCamp, Broomfield, CO (November 16, 2010)

Invited talk entitled "Crisis Technology Communities in Action"
Technology4Good BarCamp held in conjunction with Defrag 2010 Conference on data deluge

Second Annual International Conference on Crisis Mapping (ICCM), Cambridge, MA (October 1, 2010)
Invited Ignite talk entitled "Crisis Culture Curation" [YouTube Video available at: http://bit.ly/CrisisCultureCuration]
Invited to present at the Tech & Analysis Fair on "Crisis Map Mashups"

IBM Watson Research Center, Cambridge, MA (September 30, 2010)
Invited talk entitled "Digital Heritage 2.0 and the Emergence of Socially-Distributed Curation"
Presentation for the Collaborative User Experience (CUE) Group hosted by Dr. Michael Muller

Thirty-Fifth Annual Natural Hazards Research & Application Workshop, Broomfield, CO (July 10-13, 2010)
Invited panelists for the "The Tubes are Clogged: Disaster Messages via Social Media" panel
Facilitated the Gender and Disasters Roundtable

Software Engineering Undergraduate Course, Colorado School of Mines Golden, CO (April 21, 2010)
Guest lecture entitled "ICTs and Social Media in Critical Environments" for the Introduction to Software Engineering undergraduate course at Colorado School of Mines

The County Administrative Board of Västra Götaland, Gothenburg, Sweden (May 18, 2009)
Invited talk entitled "ICTs and Social Media in Critical Environments"
Public Information Officers from four municipalities across Sweden attended to learn more about how official organizations in Sweden can incorporate social media in emergency management

National Science and Technology Center for Disaster Reduction (NCDR) Taipei, Taiwan (December 19, 2007)
Invited talk entitled "Emerging Uses of Social Media During Mass Emergencies"
Presentation for the Director of NCDR, Dr. Liang-Chun Chen

ATLAS Institute Undergraduate Course, Boulder, CO (October 19, 2006)
Guest lecture entitled "Citizens' Media in Disasters" for the ATLAS Institute's Meaning of Information Technology undergraduate course at University of Colorado at Boulder

Department of Communication, Boulder, CO (October 19, 2006)
Guest lecture entitled "Integrating ICT-Supported Public Communication and Participation for Crisis Response" for undergraduate communication course at University of Colorado at Boulder

PROFESSIONAL SERVICE AND OUTREACH ACTIVITIES

Student Representative and ISCRAM Live Chair for the ISCRAM 2010 Conference (May 2 – 5, 2010)
Invited to be on the Program Committee for the Information Systems for Crisis Response and Management (ISCRAM) Conference in 2010 as a Student Representative and the ISCRAM Live Chair to facilitate conference-related social media activities for the ISCRAM Live website; Co-organizer of the ISCRAM Doctoral Colloquium

Facilitator for the 42nd High School Honors Institute (July 26 – 27, 2010)
Led a Crisis Informatics session for high school students at CU-Boulder College of Engineering and Applied Science

Docent for Dialog:City (August 22-29, 2008)
Dialog:City was a contemporary art, design, and technology exhibition catalyzing civic engagement across the greater Denver metro area during the 2008 Democratic National Convention

Invited Notetaker for the Human Factors in Computing System CHI 2006 Workshop (April 22 – 23, 2006)
Documented the discussions at the "About face interface: Creative engagement in the new media arts and HCI" Human Factors in Computing Systems CHI 2006 workshop in Montréal, Canada

Invited Recorder for 31st Annual Natural Hazards Research and Applications Workshop (July 9 – 12, 2006)
Recorder for "A Critical Look at the Incident Command System (ICS) and Contemplating Alternatives" session

Conference Paper Reviewer (2008 – Present)
Human Factors in Computing Systems (CHI) 2010 and 2009
Computer-Supported Copperative Work (CSCW) 2009
Information Systems for Crisis Response and Management (ISCRAM) 2008, 2009, and 2010
iConference 2010
Advanced Visual Interfaces 2009

Student Volunteer for Conferences (2006 – 2010)
ICCM 2010; ISCRAM 2008; CCWIC 2008; Hazards Workshop 2006 and 2007; CSCW 2006

INTERNAL AND EXTERNAL CONSULTING

Social Media Consultant for Climate Communication (November 2010 – Present)
Advising Susan Joy Hassol, a climate change communicator, using social media for climate communication projects

Chief Information Architect for Tartoosh Environmental, LLC, Boulder, CO (July 2009 – Present)
Advising Robert J. Martin, J.D. (previously the National Ombudsman for Environmental Protection Agency (EPA))
An environmental consulting company rebuilding sustainable tribal communities

Technology Consultant for US Gender & Disaster Resilience Alliance, Boulder, CO (June 2009 – Present)
Advising Dr. Elaine Enarson on the US Gender and Disaster Resilience Alliance (GDRA) website

Social Media Consultant for Staff at University of Colorado, Boulder, CO (February – June 2010)
Advised staff in Office of Media Relations & News Services on social media use (February 18, 2010)
Advised Professor Peter McGraw in the Business School on social media use (April 21, 2010)
Advised staff in the Department of Housing and Dining on social media use (June 2, 2010)

CONFERENCES ATTENDED

International Conference on Crisis Mapping (**ICCM**): 2010 (Boston, MA)

Human Factors in Computing Systems (**CHI**): 2005 (Portland, OR); 2006 (Montréal, Canada) 2007 (San Jose, CA); 2010 (Atlanta, GA)

Information Systems for Crisis Response and Management (**ISCRAM**): 2008 (Washington DC); 2009 (Gothenburg, Sweden); 2010 (Seattle, WA)

Natural Hazards Research & Application Workshop (**Hazards Workshop**): 2006, 2007 (Boulder, CO); 2008, 2009, 2010 (Broomfield, CO)

Computer-Supported Cooperative Work (**CSCW**): 2004 (Chicago, IL); 2006 (Banff, Canada); 2008 (San Diego, CA); 2009 (Savannah, GA)

Colorado Celebration of Women in Computing (**CCWIC**): 2008 (Boulder, CO)

E-Social Science: 2007 (Ann Arbor, MI)

International Symposium on Advanced Radio Technologies (**ISART**): 2006, 2010 (Boulder, CO)

Conference on World Affairs (**CWA**): 2006, 2007, 2008, 2009, 2010 (CU-Boulder, CO)

Local Colorado Bioneers: 2006, 2007, 2008, 2009, 2010 (CU-Boulder, CO)

MEDIA INTERVIEWS

KGNU's How on Earth Radio Show – "The New Technology of Tweeting and How They are Helping in the Haitian Emergency" (January 26, 2010)

Colorado Daily – "CU-Boulder Grad Students Improve Haiti Communication through Twitter" (January 21, 2010)

Denver Channel ABC 7 News – "CU Students Author New Twitter Language For Disaster Relief" (January 20, 2010)

Homeland Security Today – "Social Media Opens Communications for Terrorists and Victims" (May 20, 2009)

US News & World Report – University of Colorado at Boulder ad campaign "Redefining the Graduate Experience" (March 2009)

WXII 12 News – "Could Twitter, Facebook Save Lives?: Social Media Sites Change Disaster Management Policies" (March 10, 2009)

Denver Channel ABC 7 News – "Researchers: Social Networking Sites Critical in Disaster Situations – Emergency Managers Urged to Embrace Facebook, Twitter" (March 9, 2009)

CUEngineering 2009 Magazine for the College of Engineering and Applied Science
Cover Story on "Disaster 2.0—Emergency Response in the Age of Social Media" (Number 26, Spring 2009)

TECHNICAL SKILLS

Communication skills in social networking technologies, proficient in social media and emerging media applications; interpersonal skills; socio-cultural analyst; historical and futurist perspectives.

Experience conducting crisis-related Quick Response Research on-site (i.e., a week after 2007 Virginia Tech school shooting) and on-line (i.e., 2007 VT shooting, 2010 Haiti and Chile earthquakes, 2010 BP oil spill, 2009 & 2010 Boulder Fires).

Interaction design, user interface design skills, experience conducting usability testing, visual design skills, photo/videographer.

Experience with Facebook, Twitter, YouTube, Flickr, Delicious, Ushahidi, Google Maps, LinkedIn, Skype, Ning.

Ruby, Java, C++, HTML, Photoshop, Microsoft Word/Excel/Powerpoint, EndNote.

Typing speed: 70 words per minute.

LANGUAGES

English (native speaker), Spanish and Chinese (conversant).